and in brightness of the corona, as the sun slowly loses heat, and the actions of the photosphere become less fervent.

The candle of the sun is burning down, and so far as we can see, must at last reach the socket. Then will begin a total eclipse which will have no end:

" Dies illa
Solvet seclum in favilla."

"Results of the Harmonic Analysis of Tidal Observations." By A. W. BAIRD, Major R.E., and G. H. DARWIN, F.R.S., Fellow of Trinity College and Plumian Professor in the University of Cambridge. Received March 19, 1885.

The harmonic analysis of continuous tidal records, inaugurated by a Committee of the British Association in 1868, has now been carried out at a considerable number of ports. Some of the earlier results were collected together in the Reports to the Association in 1872 and 1876, and in a paper by Sir W. Thomson and Captain Evans, read before the Association in 1878, but the largest mass of data is contained in the tide tables now being annually published for the Indian ports under the authority of Her Majesty's Secretary of State for India.

The Report of the last Committee of the British Association, published in the volume for the meeting at Southport in 1883, is entirely theoretical, and has been adopted in India as a manual of the method of harmonic analysis. It is there shown how the results of the analysis are to be presented in a form appropriate either for theoretical treatment or for mechanical prediction by the instrument of the Indian Government in London. It is also shown how the scattered results, referred to above, may be reduced to the form which has been adopted as a standard. Major Baird has collected the whole of the Indian results, and those contained in the Reports of 1872 and 1876, and, by the aid of his staff of computers at Poona, has reduced them to this standard form. The greater part of the annexed tables is the result of this work.

We must refer to the Report to the British Association for 1883 for an explanation of the method of harmonic analysis, but it will be well to give a few words of explanation.

Each one of the tides, into which the oscillation of sea-level is regarded as analysed, is expressed in the form—

$$fH\cos(V+u-\kappa).$$

$V+u-\kappa$ is the argument of the tide, and increases uniformly with the time, so that this term represents a simple harmonic oscillation of the sea-level with semi-range f H.

It is supposed that u stands for the mean value, estimated over the year or period of observation, of a certain known function of the longitude of the moon's nodes, or in a few cases of the sun's perigee ; f stands for a factor of augmentation or diminution of the range of tide due to the variability of the obliquity of the equator to the lunar orbit, and a mean value for f estimated over the year or period of observation is adopted.   Tables for computing u and f for each tide are given in the Report.*

V is a known linear function of the local mean time, of the mean longitudes of the sun, of the moon, and of the lunar perigee, and it increases uniformly with the time ; the rate of its increase, measured say in degrees per mean solar hour, is called the speed of the tide.

The numerical operation of harmonic analysis gives us H and κ, which are constants peculiar to the port of observation.   As the tide tables are principally for the use of British sailors, H is expressed in feet and decimals of a foot, and κ is an angle less than 360°.   The argumen $V + u - \kappa$ is such that if the equilibrium theory of tides were true, with a water-covered globe, then κ would be zero ; and κ divided by the speed is the time elapsing after any theoretical equilibrium high-water until the next actual high-water ; we may call κ the " lag " of the tide.   If the equilibrium theory were true, H would have a value which may be computed from the formulæ given in the Report.

If tidal observations were perfectly accurate, and if the tides were undisturbed by the weather, H and κ would be absolute constants for each tide and for each port, whatever periods are submitted to analysis ; and in proportion as they are found to be constant so is the analysis satisfactory.

A knowledge of H and κ is necessary and sufficient to determine the height of water, as due to the particular tide, at any time, past or future.

The letters† γ, σ, η, ϖ have been appropriated to the earth's angular velocity of rotation, and to the mean motions of the moon, of the sun, and of the lunar perigee respectively.   Hence the rate of increase of V or the speed of tide, is expressible by these symbols.   For practical convenience an initial has been adopted to indicate each one of the tides ; and we here reproduce Schedule A of the Report containing the arbitrarily chosen initial letters, the speed, and a descriptive name for most of the tides.

The tides involving γ in the speed are approximately diurnal, those containing 2γ are approximately semi-diurnal, and those containing 3γ, 4γ, &c., are approximately ter-diurnal, quater-diurnal, and so on. Those whose speed does not involve γ are called tides of long period, since the quickest of them has a period of a fortnight.

* In the case of the results for the English ports below it is Greenwich mean time.

† The initials of $\gamma\tilde{\eta}$, $\sigma\epsilon\lambda\acute{\eta}\nu\eta$, $\H{\eta}\lambda\iota\sigma\varsigma$, and perigee.

Schedule of Notation.

Initials.	Speed.	Name of Tide.
M_1 M_2 M_3 &c.	$\gamma - \sigma - \varpi$, and $\gamma - \sigma + \varpi$ $2(\gamma - \sigma)$ $3(\gamma - \sigma)$ &c.	Principal lunar series.
K_2	2γ	Luni-solar semi-diurnal.
N	$2\gamma - 3\sigma + \varpi$	Larger lunar elliptic.
L	$2\gamma - \sigma - \varpi$ and $2\gamma - \sigma + \varpi$	Smaller lunar elliptic.
	$2\gamma + \sigma - \varpi$	Luni-solar elliptic semi-diurnal.
2N	$2\gamma - 4\sigma + 2\varpi$	Lunar elliptic, second order.
ν	$2\gamma - 3\sigma - \varpi + 2\eta$	Larger lunar evectional.
λ	$2\gamma - \sigma + \varpi - 2\eta$	Smaller lunar evectional.
O	$\gamma - 2\sigma$	Lunar diurnal.
OO	$\gamma + 2\sigma$	
K_1	γ	Luni-solar diurnal.
Q	$\gamma - 3\sigma + \varpi$	Larger lunar elliptic diurnal.
	$\gamma - \sigma - \varpi$ included in M_1	Smaller lunar elliptic diurnal.
J	$\gamma + \sigma - \varpi$	Luni-solar elliptic diurnal.
	$\gamma - 4\sigma + 2\varpi$	Lunar elliptic diurnal, second order.
	$\gamma - 3\sigma - \varpi + 2\eta$	Larger lunar evectional diurnal.
S_1 S_2 S_3 &c.	$\gamma - \eta$ $2(\gamma - \eta)$ $3(\gamma - \eta)$ &c.	Principal solar series.

Schedule of Notation—*continued.*

Initials.	Speed.	Name of Tide.
T	$2\gamma - 3\eta$	Larger solar elliptic.
R	$2\gamma - \eta$	Smaller solar elliptic.
P	$\gamma - 2\eta$	Solar diurnal.
Mm	$\sigma - \varpi$	Lunar monthly.
Mf	2σ	Lunar fortnightly.
Sa	η	Solar annual.
Ssa	2η	Solar semi-annual.
MSf	$2(\sigma - \eta)$	Luni-solar synodic fortnightly.
MS	$4\gamma - 2\sigma - 2\eta$	⎫
μ or 2MS	$2\gamma - 4\sigma + 2\eta$	⎪
2SM	$2\gamma + 2\sigma - 4\eta$	⎬ Compound tides.
MK	$3\gamma - 2\sigma$	⎪
2MK	$3\gamma - 4\sigma$	⎪
MN	$4\gamma - 5\sigma + \varpi$	⎭

The operations of the computers give the values of κ in degrees and two places of decimals of a degree, but as the values of κ are in no case so consistent from year to year as to present variations of less than a degree, the tables have been abridged by the entry merely of the nearest degree. The values of κ are printed in a different type from those of H, and the degree mark ° has been omitted.

In the case of the ports of Toulon and Brest the results in the Report of the Committee of the British Association were given in centimetres, but they have been reduced to feet for the sake of uniformity.

At the head of the table for each port the epoch, or instant, at which the analysed observations begin is noted; at every port (excepting

Kathiwadar) the epoch is 0h. of (old) astronomical time, or civil noon, of the day specified.

In Table I is given the latitude and longitude of the several ports.

In Table II the values are given of H and κ for each year or period analysed for the ports specified at the head; these are the values deduced from the results of 1872, 1876, 1878, and from those of the Indian Survey.

The initial of the tide is shown in the margin.

The last column for each port gives the mean of the values for the years under observation. An inspection of the numbers from which the mean is derived shows the degree of consistency between the numbers obtained in the several years. The number of results is hardly sufficient to make it worth while to deduce a probable error for H and κ; moreover, it would be a somewhat arduous task to do so.

Table III is a summary of Table II, giving only the mean values, together with the number of years from which the mean is derived, and this is of much value for the theoretical discussion of the tides.

Table IV gives Mr. Ferrel's results from the Reports to the United States Coast Survey.

The tables give altogether results for 43 ports, and for 137 periods of observation and analysis.

*[We have to thank Mr. Edward Roberts, the importance of whose work in this subject is well known, for having reduced the results given in the paper of 1878, viz., those for Freemantle, Mauritius, E. Falkland, Malta, Marseilles, and Toulon. In several of these the heights were stated in centimetres, but they are now reduced to feet and decimals.

Professor Ferrel has carried out an harmonic analysis at several ports for the United States Coast Survey. The process adopted by him does not appear to be identical with the method of the British Association, and there seemed to be room for doubt as to whether the results were truly comparable with ours. In answer to an inquiry on this point, addressed to the United States Coast Survey, Mr. Ferrel kindly sent a memorandum to the Superintendent, Mr. Hilgard, which has been forwarded for our information. The memorandum, dated Washington, April 27th, 1885, runs as follows :—

" The results of harmonic analyses of tide observations of the United States Coast and Geodetic Survey are found in Report of the British Association for 1872, and the Reports of the Coast and Geodetic Survey of 1878, App. No. 11; 1882, App. No. 17; 1883, App. No. 9. The results for Governor's Island have not yet been printed.

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* This paragraph and the corresponding portion of the tables were added on May 15, 1885, subsequently to the presentation of the paper. These results of 1878 are only given in Table III, and not also in Table II.

" Those in the Report of the B.A. are by Sir W. Thomson. In those of the Coast and Geodetic Survey the A's (amplitude) correspond with Sir W. Thomson's R's, but the ϵ's (epochs) differ from his by 90° in the diurnal components. These corrections of his epochs I introduced into my ' Tidal Researches ' in 1874, p. 44, § 28.*

" From a reference to Schedule I, Tides of Penobscot Bay, Professor Darwin with reason concludes that I have not applied this correction in the diurnal component of the κ-tides. This arises from the omission by oversight of a footnote to Schedule I, as follows :—

" ' For λ^1 read $\lambda^1 - \frac{1}{2}\pi$ in the diurnal component of the K-tide.'

" The corrections have, in all cases, been applied according to this note.

" In my ' Tidal Researches ' of 1874 I have given formulæ for the correction of both the amplitudes and epochs depending upon the position of the moon's node. These corrections reduce them to what they would have been if the moon had moved in the ecliptic. By a reverse method these amplitudes and epochs can be reduced back to any year for which practical application of the results is required. In the discussion of tides in Penobscot Bay I have also given small tables, Tables III—VI inclusive, to facilitate these corrections, and reductions depending upon the lunar node. The double signs, however, of Tables III, V, and VI, got reversed somehow in copying and printing ; but the signs have been used correctly in the reductions, even in those of the Report in which the signs are given erroneously, which shows that they were at first correct, and that the error was introduced in copying.

" These nodal corrections have in all cases been applied to the results, so that in these corrected results the irregularity of long period depending upon the moon's node is eliminated, and the amplitudes and epochs are the same from year to year, except so far as they are affected by small irregularities from abnormal disturbances not completely eliminated. An exception to this, however, is the case of the St. Thomas tides, in which the reductions were not carried so far, and these small nodal corrections were not applied to these small tides. The amplitudes and epochs are those simply belonging to the years of observations. . . . It is certainly desirable to have an international uniform notation.

" I should have stated sooner that in Table II, column C, 90° have

* [Notwithstanding this assurance I venture to think that Mr. Ferrel must be mistaken. For example, at Sandy Hook, it looks as though it were certain that K_2, L, λ have been reduced according to one rule, and the rest of the semi-diurnal tides according to another ; for the phases differ by about 180°. Compare again O, K_1, P with J and Q at Penobscot Bay.—G. H. D., August 12, 1885.]

[It may be noticed that κ of S_1 for San Diego differs by 180° in the U.S. reduction from the value in the B.A. reduction. I have no evidence as to which is correct.—G. H. D., October, 1885.]

always been deducted before using it in the reductions in the case of the diurnal component of the K-tides."

We give below the results above referred to by Mr. Ferrel. We may remark, however, that the heights have been abridged by the omission of a place of decimals, and the epochs by the omission of the decimals of a degree. We have not, however, given quite all the results of the United States Coast Survey. Mr. Ferrel's treatment of M_1 is not identical with ours, and it is omitted; also there is no place vacant for some of the smaller overtides in our schedules. The reader especially interested in these tides is therefore advised to refer also to the original sources. The results for St. Thomas are derived from a letter dated March 10th, 1885, addressed by Mr. Ferrel to the superintendent, and kindly communicated to us.

From the correspondence it appears that the American results should be comparable with the others, or at least that the difference should be insignificant. As remarked, however, in a footnote on the preceding page, this conclusion is open to doubt. We have thought it best, therefore, to keep these results in a table separate from the others.]

Table I.

Indian Tide Tables.

	lat.			long.	
Aden...............................	12°	47′ N.	....	44°	59′ E.
Karachi	24	47	....	66	58
Okha Point and Beyt Harbour, Gulf of Cutch	22	28	....	69	7
Kathiwadar or Shial Bet, S. coast of Kattywar	20	58	....	71	36
Bombay, Apollo Bunder	18	55	....	72	50
Karwar...............................	14	48	....	74	6
Beypore, 7 miles S. of Calicut.............	11	10	....	75	49
Paumben Pass, island of Ramesweram	9	16	....	79	11
Negapatam	10	46	....	79	53
Madras	13	4	....	80	15
Vizagapatam	17	41	....	83	17
False Point...........................	20	25	....	86	47
Dublat, Saugor Island, River Hooghly	21	38	....	88	6
Diamond Harbour, River Hooghly..........	22	11	....	88	14
Kidderpore, River Hooghly...............	22	32	....	88	22
Elephant Point	16	29	....	96	19
Rangoon..............................	16	46	....	96	12
Amherst	16	5	....	97	34
Moulmein.............................	16	29	....	97	40
Port Blair, Ross Island...................	11	41	....	92	45

British Association Reports.

N.B.—*Results for English ports are referred to Greenwich mean time.*

	lat.			long.	
Fort Point, California..................	37	40 N.	....	122	15 W.
San Diego, California..................	32	42	....	117	13
Port Leopold, Arctic Archipelago..........	74	—	....	91	—
Beechey Island, Erebus Bay, Arctic Archip...	74	43	....	91	54
Cat Island, Gulf of Mexico	30	23	....	89	0
Toulon...............................	43	7	....	5	56 E.
Brest................................	48	23	....	4	30 W.
Ramsgate	51	18	....	1	21 E.
West Hartlepool	54	41	....	1	12 W.
Portland Breakwater	50	30	....	2	24
Liverpool	53	24	....	3	0
Helbre Island....... .... about	53	24	.. about	3	0
Freemantle, West Australia	32	3 S.	....	115	45 E.
Mauritius, Port Louis	20	9	....	57	11
East Falkland, Port Louis, Berkeley Sound ..	51	29	....	58	0 W.
Malta	35	55 N.	....	14	30 E.
Marseilles............................	43	18	....	5	23

United States Coast Survey Reports.

	lat.			long.	
Penobscot Bay, Pulpit Cove, Maine.........	44	9 N.	....	68	53 W.
Port Townsend, Puget Sound, Washington Territory..............................	48	8	....	122	48
Astoria, Columbia River, Oregon...........	46	11	....	123	50
San Diego Bay, California................	32	43	....	117	10
St. Thomas, West Indies	18	20	....	64	56
Sandy Hook.........................	40	27	....	74	1

Table II.

Aden.

Commence 0 h., March 3.

Year	1879–80.	1880–1.	1881–2.	1882–3.	Mean.
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·073 168	0·117 151	0·093 161	0·077 166	0·090 162
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·693 248	0·693 252	0·704 246	0·699 247	0·697 248
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·006 263	0·005 257	0·006 275	0·005 290	0·006 271
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·005 218	0·004 191	0·004 210	0·004 185	0·004 201
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·001 212	0·001 238	0·001 325	0·001 261	0·001 259
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·033 30	0·052 12	0·053 355	0·048 45	0·047 21
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	1·578 228	1·558 232	1·569 228	1·567 227	1·568 229
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·019 220	0·020 215	0·018 201	0·016 202	0·018 209
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·011 322	0·006 334	0·007 318	0·003 281	0·007 314
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·006 343	0·004 280	0·004 26	0·007 355	0·005 341
$M_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·003 87	0·001 49	0·004 333	0·002 65	0·003 43
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·657 38	0·658 40	0·646 38	0·651 38	0·653 38
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	1·295 36	1·297 38	1·299 36	1·305 36	1·299 36
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·218 245	0·197 244	0·188 242	0·202 246	0·201 244
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·389 31	0·375 35	0·389 33	0·399 31	0·388 33
$J \begin{cases} H = \\ \kappa = \end{cases}$	0·118 49	0·110 70	0·083 53	0·100 35	0·103 52

Table II.

Aden.

Commence 0 h., March 3.

Year	1879–80.	1880–1.	1881–2.	1882–3.	Mean.
Q $\begin{cases} H = \\ \kappa = \end{cases}$	0·174 40	0·157 38	0·134 42	0·139 48	0·151 42
L $\begin{cases} H = \\ \kappa = \end{cases}$	0·023 259	0·063 230	0·033 209	0·065 223	0·046 230
N $\begin{cases} H = \\ \kappa = \end{cases}$	0·443 223	0·436 230	0·421 224	0·409 222	0·427 225
λ $\begin{cases} H = \\ \kappa = \end{cases}$	0·018 123	0·020 301	0·038 210	0·026 155	0·026 197
ν $\begin{cases} H = \\ \kappa = \end{cases}$	0·157 241	0·132 200	0·059 170	0·048 293	0·099 226
μ $\begin{cases} H = \\ \kappa = \end{cases}$	0·086 192	0·082 204	0·072 182	0·058 204	0·075 196
R $\begin{cases} H = \\ \kappa = \end{cases}$	. . . .	0·006 64	. . . .	0·003 356	0·005 30
T $\begin{cases} H = \\ \kappa = \end{cases}$	. . . .	0·057 286	. . . .	0·042 194	0·050 240
MS $\begin{cases} H = \\ \kappa = \end{cases}$	0·007 136	0·020 167	0·009 166	0·011 167	0·012 159
2SM $\begin{cases} H = \\ \kappa = \end{cases}$	0·022 106	0·021 101	0·021 114	0·026 114	0·023 109
Mm $\begin{cases} H = \\ \kappa = \end{cases}$	0·035 5	0·076 348	0·025 324	0·033 18	0·042 354
Mf $\begin{cases} H = \\ \kappa = \end{cases}$	0·052 14	0·039 30	0·045 26	0·044 53	0·045 31
MSf $\begin{cases} H = \\ \kappa = \end{cases}$	0·014 40	0·015 295	0·016 98	0·010 209	0·014 341
Sa $\begin{cases} H = \\ \kappa = \end{cases}$	0·404 3	0·402 358	0·353 2	0·399 347	0·390 357
Ssa $\begin{cases} H = \\ \kappa = \end{cases}$	0·110 94	0·109 161	0·093 151	0·069 99	0·095 126

Table II.

Karachi.

Commence 0 h., May 1.

Year	1868–9.	1869–70.	1870–1.	1871–2.	1872–3.	1873–4.
S_1 $\{$ H =	0·072	0·071	0·075	0·083	0·108	0·083
$\quad$ κ =	177	188	162	158	147	155
S_2 $\{$ H =	0·932	0·943	0·923	0·951	0·952	0·943
$\quad$ κ =	323	324	324	322	322	321
S_4 $\{$ H =	......	......	0·014	0·013	0·008	0·010
$\quad$ κ =	......	......	356	5	0	326
S_6 $\{$ H =	......	......	......	0·004	0·012	0·004
$\quad$ κ =	......	......	......	293	295	312
S_8 $\{$ H =	......	......	......	......	......	0·000
$\quad$ κ =	......	......	......	......	......	27
M_1 $\{$ H =	0·013	......	0·030	0·063	0·040	0·038
$\quad$ κ =	336	......	78	23	359	46
M_2 $\{$ H =	2·511	2·447	2·450	2·492	2·476	2·471
$\quad$ κ =	294	295	295	294	294	293
M_3 $\{$ H =	0·042	0·037	0·048	0·048	0·037	0·030
$\quad$ κ =	333	333	322	332	316	330
M_4 $\{$ H =	0·016	0·027	0·024	0·029	0·020	0·022
$\quad$ κ =	44	27	28	23	28	9
M_6 $\{$ H =	0·040	0·046	0·044	0·045	0·046	0·048
$\quad$ κ =	222	210	218	203	214	208
M_8 $\{$ H =	......	......	......	0·006	0·006	0·003
$\quad$ κ =	......	......	......	249	266	155
O $\{$ H =	0·662	0·645	0·629	0·636	0·632	0·645
$\quad$ κ =	47	50	48	47	46	46
K_1 $\{$ H =	1·278	1·257	1·255	1·279	1·275	1·269
$\quad$ κ =	47	47	48	46	46	46
K_2 $\{$ H =	0·299	0·273	0·260	0·293	0·292	0·274
$\quad$ κ =	329	315	313	321	321	315
P $\{$ H =	0·376	0·385	0·375	0·360	0·368	0·393
$\quad$ κ =	46	50	45	48	47	48
J $\{$ H =	0·091	0·046	0·070	0·107	0·104	0·059
$\quad$ κ =	79	64	38	61	82	157

Table II.

Karachi.

Commence 0 h., May 1.

Year......	1868–9.	1869–70.	1870–1.	1871–2.	1872–3.	1873–4.
Q $\begin{cases} H = \\ \kappa = \end{cases}$	0·129 46	0·120 61	0·138 54	0·146 50	0·129 52	0·119 63
L $\begin{cases} H = \\ \kappa = \end{cases}$	0·079 298	0·047 321	0·089 294	0·043 356	0·137 263	0·084 284
N $\begin{cases} H = \\ \kappa = \end{cases}$	0·604 279	0·587 281	0·572 279	0·650 280	0·605 275	0·587 278
λ $\begin{cases} H = \\ \kappa = \end{cases}$	0·059 335	0·037 270	0·043 209	0·084 207	0·076 12	0·041 259
ν $\begin{cases} H = \\ \kappa = \end{cases}$	0·190 254	0·081 223	0·080 343	0·143 284	0·191 300	0·116 238
μ $\begin{cases} H = \\ \kappa = \end{cases}$	0·066 267	0·032 224	0·070 300	0·062 254	0·055 270	0·055 232
R $\begin{cases} H = \\ \kappa = \end{cases}$	....	0·035 271	....	0·027 221	....	0·021 228
T $\begin{cases} H = \\ \kappa = \end{cases}$	....	0·111 320	....	0·058 22	....	0·012 233
MS $\begin{cases} H = \\ \kappa = \end{cases}$	0·017 215	0·024 180	0·031 324	0·020 358	....	0·023 307
2SM $\begin{cases} H = \\ \kappa = \end{cases}$	....	....	....	....	....	0·007 128
Mm $\begin{cases} H = \\ \kappa = \end{cases}$	0·069 248	0·040 175	0·031 116	....	....	0·055 56
Mf $\begin{cases} H = \\ \kappa = \end{cases}$	0·053 318	0·078 311	0·037 259	....	....	0·012 223
MSf $\begin{cases} H = \\ \kappa = \end{cases}$	0·009 328	0·074 19	0·057 159	....	....	0·042 44
Sa $\begin{cases} H = \\ \kappa = \end{cases}$	0·115 44	0·179 80	0·162 107	....	....	0·250 95
Ssa $\begin{cases} H = \\ \kappa = \end{cases}$	0·198 82	0·059 117	0·062 70	....	....	0·211 162

Table II.

Karachi.

Commence 0 h., May 1.

Year	1874–5.	1875–6.	1876–7.	1877–8.	1878–9.	1879–80.
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·076 153	0·079 150	0·087 157	0·088 181	0·044 167	0·086 161
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·949 320	0·953 320	0·936 318	0·961 321	0·922 324	0·957 325
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·008 6	0·008 353	0·012 17	0·010 23	0·009 29	0·008 63
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·007 309	0·009 295	0·006 259	0·005 275	0·008 291	0·006 325
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·003 266	0·002 283	0·001 207	0·002 254	0·001 126	0·002 223
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·055 66	0·081 36	0·015 353	0·013 76	0·035 54	0·060 14
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	2·517 292	2·550 291	2·474 291	2·468 291	2·521 296	2·555 296
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·026 336	0·037 345	0·037 343	0·055 327	0·048 328	0·042 320
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·020 8	0·025 15	0·019 353	0·024 16	0·031 2	0·027 7
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·056 212	0·055 206	0·049 207	0·053 196	0·051 215	0·055 220
$M_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·006 196	0·006 297	0·006 281	0·006 252	0·004 269	0·003 20
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·647 46	0·649 46	0·646 45	0·654 46	0·677 49	0·654 47
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	1·292 46	1·296 46	1·263 44	1·278 45	1·314 48	1·301 48
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·247 316	0·261 321	0·276 318	0·260 314	0·240 329	0·284 325
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·386 46	0·367 45	0·368 49	0·423 43	0·440 44	0·396 45
$J \begin{cases} H = \\ \kappa = \end{cases}$	0·088 35	0·104 50	0·077 71	0·025 88	0·084 66	0·102 64

Table II.

Karachi.

Commence 0 h., May 1.

Year	1874–5.	1875–6.	1876–7.	1877–8.	1878–9.	1879–80.
Q $\{$ H = κ =	0·123 58	0·136 46	0·124 35	0·110 48	0·150 47	0·154 50
L $\{$ H = κ =	0·088 280	0·042 302	0·085 306	0·099 305	0·054 263	0·066 312
N $\{$ H = κ =	0·560 276	0·602 274	0·606 273	0·556 273	0·667 274	0·597 280
λ $\{$ H = κ =	0·022 181	0·009 95	0·040 300	0·082 236	0·063 184	0·019 35
ν $\{$ H = κ =	0·023 320	0·154 317	0·207 285	0·218 236	0·127 211	0·089 332
μ $\{$ H = κ =	0·056 274	0·070 260	0·068 280	0·113 217	0·041 297	0·077 249
R $\{$ H = κ =	....	....	0·008 308	....	0·069 273	....
T $\{$ H = κ =	....	....	0·122 344	....	0·059 315	....
MS $\{$ H = κ =	0·021 304	0·031 315	0·034 313	0·030 326	0·033 351	0·031 337
2SM $\{$ H = κ =	0·018 150	0·025 98	0·012 115	0·026 63	0·019 167	0·018 158
Mm $\{$ H = κ =	0·064 24	0·067 103	0·097 42	0·124 49	....	0·040 26
Mf $\{$ H = κ =	0·033 41	0·010 24	0·032 1	0·047 30	....	0·030 328
MSf $\{$ H = κ =	0·040 333	0·015 186	0·045 195	0·038 314	....	0·030 318
Sa $\{$ H = κ =	0·149 56	0·086 76	0·197 80	0·170 120	....	0·042 86
Ssa $\{$ H = κ =	0·172 157	0·173 167	0·145 164	0·087 70	....	0·165 171

Table II.

(a) *Karachi.*   (b) *Okha.*   (c) *Kathiwadar.*

(a) Com. 0h., May 1.   (b) Com. 0 h., Apr. 16.   (c) Com. 12 h., Oct. 31.

	(a)	(a)	(a)	(a)	(b)	(c)
Year	1880–1.	1881–2.	1882–3.	Mean.	1874–5.	1881–2.
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·135 64	0·076 174	0·066 172	0·082 158	0·074 150	0·134 201
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·969 324	0·960 324	0·962 324	0·948 322	1·222 14	1·207 81
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·006 31	0·012 12	0·008 35	0·010 14	0·013 117	0·029 273
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·006 292	0·008 314	0·006 287	0·007 295	0·003 21	0·013 42
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·001 11	0·000 124	0·001 162	0·001 204	0·001 220	0·002 264
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·059 319	0·048 39	0·062 61	0·044 30	0·051 43	0·057 35
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	2·536 295	2·541 294	2·558 294	2·504 294	3·820 347	2·970 55
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·039 319	0·034 327	0·030 336	0·039 330	0·030 21	0·020 152
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·026 2	0·027 17	0·023 359	0·024 14	0·136 107	0·220 178
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·052 209	0·049 207	0·044 204	0·049 210	0·007 270	0·139 137
$M_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·002 341	0·009 257	0·002 262	0·005 267	0·011 96	0·002 199
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·632 46	0·654 46	0·645 47	0·647 47	0·693 57	0·720 66
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	1·246 47	1·295 47	1·310 47	1·281 46	1·414 53	1·611 66
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·415 322	0·269 317	0·234 321	0·278 320	0·328 17	0·324 79
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·266 49	0·396 46	0·396 44	0·380 46	0·384 50	0·436 71
$J \begin{cases} H = \\ \kappa = \end{cases}$	0·066 106	0·063 53	0·099 38	0·079 70	0·107 81	0·175 107

Table II.

(a) *Karachi.* (b) *Okha.* (c) *Kathiwadar.*

(a) Com. 0. h., May 1. (b) Com. 0 h., April 16. (c) Com. 12 h., Oct. 31.

		(a)	(a)	(a)	(a)	(b)	(c)
Year		1880–1.	1881–2.	1882–3.	Mean.	1874–5.	1881–2.
Q	H =	0·104	0·124	0·132	0·129	0·137	0·152
	κ =	51	64	61	52	59	68
L	H =	0·123	0·096	0·076	0·081	0·221	0·079
	κ =	310	291	293	299	23	261
N	H =	0·581	0·631	0·594	0·600	0·781	0·755
	κ =	276	279	280	277	322	34
λ	H =	0·020	0·029	0·001	0·042	0·073	0·043
	κ =	313	275	236	282	23	107
ν	H =	0·169	0·211	0·125	0·142	0·164	0·131
	κ =	314	264	236	277	8	15
μ	H =	0·037	0·081	0·039	0·061	0·203	0·286
	κ =	283	267	270	263	182	343
R	H =	0·040	......	0·009	0·030		
	κ =	317	......	315	276		
T	H =	0·094	......	0·021	0·068		
	κ =	330	......	41	332		
MS	H =	0·028	0·030	0·024	0·027	0·064	0·159
	κ =	317	327	328	307	111	215
2SM	H =	0·031	0·030	0·021	0·021	0·044	0·029
	κ =	120	121	115	123	292	154
Mm	H =	0·036	0·055	0·040	0·060	0·066	0·052
	κ =	131	72	94	95	311	8
Mf	H =	0·020	0·034	0·006	0·033	0·050	0·027
	κ =	71	254	128	316	44	103
MSf	H =	0·018	0·043	0·023	0·036	0·141	0·040
	κ =	302	131	148	266	250	153
Sa	H =	0·102	0·100	0·099	0·138	0·162	0·236
	κ =	102	50	51	79	3	133
Ssa	H =	0·139	0·116	0·098	0·135	0·121	0·109
	κ =	192	164	194	142	145	156

Major A. W. Baird and Prof. G. H. Darwin.

Table II.

Bombay.

Commence 0 h., January 1.

Year	1878.	1879.	1880.	1881.	1882.	Mean.
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·075 / 187	0·083 / 184	0·088 / 182	0·074 / 179	0·072 / 179	0·078 / 182
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	1·614 / 3	1·634 / 2	1·627 / 4	1·618 / 3	1·616 / 4	1·622 / 3
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·018 / 257	0·013 / 235	0·013 / 239	0·011 / 315	0·006 / 233	0·012 / 256
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·002 / 195	0·004 / 179	0·004 / 140	0·005 / 160	0·002 / 182	0·003 / 171
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·002 / 86	0·002 / 196	0·001 / 151	0·002 / 69	0·000 / 72	0·001 / 115
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·024 / 46	0·036 / 105	0·086 / 51	0·065 / 19	0·045 / 26	0·051 / 49
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	3·991 / 330	4·041 / 329	4·065 / 330	4·058 / 331	4·014 / 330	4·034 / 330
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·074 / 32	0·067 / 28	0·068 / 25	0·055 / 11	0·060 / 21	0·065 / 23
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·119 / 320	0·129 / 327	0·120 / 314	0·126 / 324	0·124 / 328	0·124 / 322
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·014 / 130	0·015 / 110	0·002 / 79	0·017 / 113	0·008 / 124	0·011 / 111
$M_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·003 / 316	0·004 / 347	0·002 / 313	0·004 / 13	0·005 / 46	0·004 / 351
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·643 / 48	0·650 / 48	0·663 / 48	0·647 / 48	0·645 / 49	0·650 / 48
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	1·384 / 46	1·391 / 45	1·393 / 45	1·398 / 45	1·398 / 45	1·393 / 45
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·412 / 349	0·394 / 353	0·427 / 355	0·431 / 353	0·388 / 351	0·410 / 352
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·404 / 42	0·400 / 43	0·406 / 44	0·403 / 42	0·396 / 41	0·402 / 42
$J \begin{cases} H = \\ \kappa = \end{cases}$	0·043 / 89	0·083 / 48	0·128 / 62	0·122 / 88	0·067 / 74	0·089 / 72

Table II.

Bombay.

Commence 0 h., January 1.

Year	1878.	1879.	1880.	1881.	1882.	Mean.
Q $\{$ H = κ =	0·122 47	0·138 60	0·159 55	0·133 46	0·101 50	0·131 52
L $\{$ H = κ =	0·122 299	0·054 348	0·128 325	0·094 306	0·143 298	0·108 316
N $\{$ H = κ =	1·024 312	1·036 315	0·991 316	0·974 315	0·988 312	1·003 314
λ $\{$ H = κ =	0·051 284	0·023 254	0·030 157	0·013 203	0·043 277	0·032 235
ν $\{$ H = κ =	0·288 319	0·245 283	0·078 269	0·121 9	0·261 336	0·199 315
μ $\{$ H = κ =	0·231 313	0·189 294	0·214 314	0·182 301	0·212 318	0·206 308
R $\{$ H = κ =	....	0·046 301	....	0·037 265	....	0·042 283
T $\{$ H = κ =	....	0·086 46	....	0·256 2	....	0·171 24
MS $\{$ H = κ =	0·122 17	0·138 30	0·126 23	0·125 25	0·134 25	0·129 24
2SM $\{$ H = κ =	0·039 91	0·025 125	0·048 112	0·036 109	0·033 94	0·036 106
Mm $\{$ H = κ =	0·058 315	0·049 355	0·042 86	0·047 56	0·085 36	0·056 26
Mf $\{$ H = κ =	0·068 346	0·054 7	0·054 1	0·029 250	0·052 47	0·051 346
MSf $\{$ H = κ =	0·056 198	0·016 287	0·042 184	0·019 334	0·023 136	0·031 228
Sa $\{$ H = κ =	0·254 117	0·137 330	0·173 313	0·188 317	0·179 355·	0·186 358
Ssa $\{$ H = κ =	0·068 304	0·124 223	0·071 162	0·201 232	0·145 218	0·122 228

Table II.

Karwar.

Commence 0 h., March 1.

Year	1878–9.	1879–80.	1880–1.	1881–2.	1882–3.	Mean.
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·067 159	0·075 149	0·055 156	0·052 165	0·035 167	0·057 159
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·631 335	0·629 336	0·621 334	0·616 333	0·625 335	0·624 335
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·007 115	0·007 87	0·016 94	0·011 110	0·011 92	0·010 100
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·002 32	0·007 58	0·004 82	0·006 51	0·006 39	0·005 52
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·002 344	0·002 295	0·000 297	0·002 283	0·004 303	0·002 304
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·019 70	0·017 45	0·049 29	0·045 10	0·036 48	0·033 41
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	1·724 303	1·733 303	1·757 301	1·754 301	1·741 301	1·742 302
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·012 280	0·014 286	0·018 275	0·012 264	0·012 261	0·014 273
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·045 28	0·059 22	0·054 11	0·059 16	0·060 7	0·055 17
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·013 289	0·010 283	0·013 277	0·011 284	0·009 287	0·011 284
$M_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·001 210	0·003 51	0·004 9	0·002 58	0·002 215	0·002 109
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·496 50	0·498 50	0·505 49	0·494 48	0·493 49	0·497 49
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	1·001 47	0·996 47	1·010 45	1·008 44	1·006 45	1·004 45
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·175 330	0·174 329	0·164 327	0·175 333	0·180 330	0·174 330
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·269 41	0·274 43	0·282 43	0·287 41	0·274 40	0·277 42
$J \begin{cases} H = \\ \kappa = \end{cases}$	0·046 51	0·078 55	0·087 71	0·064 67	0·065 42	0·068 57

Table II.

Karwar.

Commence 0 h., March 1.

Year	1878–9.	1879–80.	1880–1.	1881–2.	1882–3.	Mean.
Q $\begin{cases} H = \\ \kappa = \end{cases}$	0·111 57	0·133 62	0·130 54	0·101 58	0·097 63	0·114 59
L $\begin{cases} H = \\ \kappa = \end{cases}$	0·093 326	0·041 325	0·059 318	0·038 292	0·050 324	0·056 317
N $\begin{cases} H = \\ \kappa = \end{cases}$	0·416 282	0·426 284	0·413 282	0·400 281	0·397 279	0·410 282
λ $\begin{cases} H = \\ \kappa = \end{cases}$	0·022 244	0·004 122	0·032 29	0·021 341	0·021 268	0·020 273
ν $\begin{cases} H = \\ \kappa = \end{cases}$	0·077 340	0·136 297	0·122 261	0·057 232	0·047 338	0·088 294
μ $\begin{cases} H = \\ \kappa = \end{cases}$	0·033 283	0·057 245	0·046 260	0·051 244	0·033 284	0·044 263
R $\begin{cases} H = \\ \kappa = \end{cases}$	....	0·006 61	....	0·009 230	....	0·008 145
T $\begin{cases} H = \\ \kappa = \end{cases}$	....	0·046 9	....	0·075 300	....	0·061 155
MS $\begin{cases} H = \\ \kappa = \end{cases}$	0·022 80	0·028 75	0·021 61	0·029 60	0·028 60	0·026 67
2SM $\begin{cases} H = \\ \kappa = \end{cases}$	0·012 31	0·004 353	0·004 15	0·007 106	0·009 351	0·007 315
Mm $\begin{cases} H = \\ \kappa = \end{cases}$	0·046 351	0·061 14	0·048 100	0·043 0	0·126 32	0·065 27
Mf $\begin{cases} H = \\ \kappa = \end{cases}$	0·051 345	0·058 1	0·034 346	0·038 14	0·027 37	0·042 5
MSf $\begin{cases} H = \\ \kappa = \end{cases}$	0·029 214	0·023 268	0·021 222	0·009 89	0·030 27	0·022 164
Sa $\begin{cases} H = \\ \kappa = \end{cases}$	0·170 322	0·344 307	0·491 303	0·383 303	0·373 317	0·352 310
Ssa $\begin{cases} H = \\ \kappa = \end{cases}$	0·045 297	0·083 202	0·128 191	0·053 224	0·033 225	0·068 228

Table II.

Beypore.

Commence 0 h., December 1.

Year	1878–9.	1879–80.	1880–1.	1881–2.	1882–3.	Mean.
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·021 120	0·083 207	0·093 187	0·073 185	0·035 173	0·061 174
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·331 20	0·310 19	0·308 22	0·341 17	0·359 12	0·330 18
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·004 140	0·003 118	0·004 133	0·006 145	0·007 148	0·005 137
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·004 252	0·004 244	0·003 266	0·006 227	0·010 248	0·005 247
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·001 21	0·000 252	0·001 45	0·001 319	0·001 339	0·001 339
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·017 146	0·032 69	0·038 23	0·024 40	0·032 90	0·029 73
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·907 330	0·904 330	0·895 333	0·950 329	1·001 324	0·931 329
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·011 214	0·010 184	0·011 200	0·010 196	0·009 194	0·010 197
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·021 45	0·015 36	0·018 53	0·020 41	0·026 31	0·020 41
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·010 121	0·004 114	0·003 184	0·006 138	0·012 133	0·007 138
$M_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·008 137	0·010 130	0·007 140	0·008 162	0·009 162	0·008 146
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·337 58	0·338 57	0·334 59	0·337 57	0·356 55	0·340 57
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·704 52	0·691 53	0·683 54	0·715 51	0·727 47	0·704 52
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·065 11	0·079 3	0·089 13	0·069 11	0·098 17	0·080 11
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·184 49	0·188 56	0·197 57	0·177 54	0·211 48	0·191 53
$J \begin{cases} H = \\ \kappa = \end{cases}$	0·035 67	0·047 44	0·064 84	0·040 82	0·034 40	0·044 63

Table II.

Beypore.

Commence 0 h., December 1.

Year	1878–9.	1879–80.	1880–1.	1881–2.	1882–3.	Mean.
Q $\begin{cases} H = \\ \kappa = \end{cases}$	0·078 68	0·089 76	0·082 59	0·078 62	0·078 67	0·081 66
L $\begin{cases} H = \\ \kappa = \end{cases}$	0·018 349	0·037 341	0·020 342	0·033 347	0·025 1	0·027 348
N $\begin{cases} H = \\ \kappa = \end{cases}$	0·191 306	0·189 309	0·190 302	0·199 307	0·215 299	0·197 305
λ $\begin{cases} H = \\ \kappa = \end{cases}$	0·004 187	0·012 1	0·013 289	0·017 14	0·011 354	0·011 313
ν $\begin{cases} H = \\ \kappa = \end{cases}$	0·035 249	0·041 20	0·050 354	0·095 296	0·053 277	0·055 311
μ $\begin{cases} H = \\ \kappa = \end{cases}$	0·024 202	0·020 349	0·008 203	0·014 299	0·030 239	0·019 258
R $\begin{cases} H = \\ \kappa = \end{cases}$	....	0·017 163	....	0·028 101	....	0·023 132
T $\begin{cases} H = \\ \kappa = \end{cases}$	....	0·043 37	....	0·036 0	....	0·040 19
MS $\begin{cases} H = \\ \kappa = \end{cases}$	0·010 76	0·004 80	0·005 100	0·008 57	0·016 69	0·009 77
2SM $\begin{cases} H = \\ \kappa = \end{cases}$	0·006 65	0·004 219	0·004 241	0·004 243	0·007 350	0·005 296
Mm $\begin{cases} H = \\ \kappa = \end{cases}$	0·073 6	0·072 85	0·105 350	0·144 33	0·059 44	0·091 32
Mf $\begin{cases} H = \\ \kappa = \end{cases}$	0·086 15	0·086 18	0·022 50	0·118 48	0·044 346	0·071 23
Msf $\begin{cases} H = \\ \kappa = \end{cases}$	0·066 228	0·037 167	0·017 275	0·041 197	0·028 214	0·033 216
Sa $\begin{cases} H = \\ \kappa = \end{cases}$	0·307 311	0·344 316	0·328 311	0·321 329	0·243 298	0·309 313
Ssa $\begin{cases} H = \\ \kappa = \end{cases}$	0·139 226	0·252 181	0·180 208	0·189 193	0·123 214	0·177 205

Table II.

Paumben.

Commence 0 h., October 1.

Year	1878–9.	1879–80.	1880–1.	1881–2.	Mean.
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·036 146	0·049 131	0·035 153	0·022 163	0·036 148
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·377 90	0·375 92	0·377 91	0·360 94	0·372 92
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·005 287	0·001 191	0·004 262	0·003 304	0·003 261
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·002 246	0·001 168	0·005 195	0·006 179	0·004 197
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·004 249	0·005 255	0·002 257	0·001 135	0·003 224
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·013 17	0·009 38	0·013 64	0·008 19	0·011 35
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·589 47	0·585 47	0·598 46	0·569 49	0·585 47
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·016 170	0·016 168	0·015 165	0·017 177	0·016 170
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·020 199	0·016 190	0·015 199	0·014 187	0·016 194
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·011 42	0·011 50	0·011 40	0·009 34	0·011 42
$M_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·005 294	0·004 348	0·004 303	0·007 313	0·005 314
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·114 47	0·113 45	0·116 43	0·115 47	0·115 45
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·297 44	0·293 45	0·295 45	0·291 49	0·294 46
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·103 84	0·110 92	0·116 89	0·121 94	0·113 90
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·105 44	0·110 47	0·108 46	0·115 50	0·110 46
$J \begin{cases} H = \\ \kappa = \end{cases}$	0·008 68	0·013 44	0·014 38	0·021 42	0·014 48

Table II.

Paumben.

Commence 0 h., October 1.

Year	1878–9.	1879–80.	1880–1.	1881–2.	Mean.
Q { H = { κ =	0·025 84	0·021 98	0·023 91	0·016 81	0·021 89
L { H = { κ =	0·023 56	0·026 49	0·016 79	0·026 50	0·023 58
N { H = { κ =	0·076 29	0·087 30	0·084 32	0·082 32	0·082 31
λ { H = { κ =	0·017 63	0·023 24	0·008 354	0·014 173	0·016 64
ν { H = { κ =	0·016 82	0·034 49	0·030 15	0·027 334	0·027 30
μ { H = { κ =	0·004 78	0·010 98	0·012 95	0·011 148	0·009 105
R { H = { κ =	....	0·012 133	....	0·019 94	0·016 114
T { H = { κ =	....	0·038 104	....	0·012 79	0·025 92
MS { H = { κ =	0·021 292	0·017 294	0·018 286	0·017 295	0·018 292
2SM { H = { κ =	0·010 6	0·008 338	0·012 340	0·008 288	0·010 333
Mm { H = { κ =	0·063 349	0·053 58	0·033 23	0·043 40	0·048 27
Mf { H = { κ =	0·045 2	0·040 355	0·053 359	0·033 344	0·043 355
MSf { H = { κ =	0·016 174	0·013 209	0·027 157	0·007 27	0·016 141
Sa { H = { κ =	0·122 299	0·138 318	0·164 287	0·171 304	0·149 302
Ssa { H = { κ =	0·138 96	0·178 110	0·184 117	0·129 111	0·157 108

Table II.

| *Negapatam.* | | | | *Madras.* | | | |

Negapatam.　　　　　　　　　　　　　*Madras.*

Commence 0 h., December 6.　　　　Commence 0 h., February 1.

Year	1881–2.	1882–3.	Mean.	1880–1.	1881–2.	1882–3.	Mean.
S_1 { H =	0·048	0·014	0·046	0·037	0·026	0·012	0·025
$\quad$ { κ =	117	100	108	80	96	99	92
S_2 { H =	0·271	0·277	0·274	0·437	0·445	0·440	0·441
$\quad$ { κ =	283	286	284	277	275	276	276
S_4 { H =	0·006	0·004	0·005	0·002	0·002	0·001	0·002
$\quad$ { κ =	136	166	151	98	169	218	161
S_6 { H =	0·000	0·000	0·000	0·002	0·001	0·001	0·001
$\quad$ { κ =	135	166	150	61	99	176	112
S_8 { H =	0·001	0·001	0·001	0·001	0·000	0·001	0·001
$\quad$ { κ =	225	228	227	131	63	291	162
M_1 { H =	0·003	0·006	0·005	0·019	0·001	0·004	0·008
$\quad$ { κ =	149	73	111	4	312	65	7
M_2 { H =	0·712	0·727	0·720	1·047	1·051	1·049	1·049
$\quad$ { κ =	251	252	252	249	247	248	248
M_3 { H =	0·003	0·003	0·003	0·004	0·003	0·006	0·004
$\quad$ { κ =	73	133	103	65	55	67	62
M_4 { H =	0·023	0·018	0·021	0·002	0·001	0·005	0·003
$\quad$ { κ =	76	77	77	130	115	193	146
M_6 { H =	0·010	0·013	0·012	0·010	0·011	0·009	0·010
$\quad$ { κ =	130	126	128	161	149	154	154
M_8 { H =	0·005	0·004	0·005	0·002	0·001	0·002	0·002
$\quad$ { κ =	297	309	303	331	84	83	46
O { H =	0·092	0·089	0·091	0·094	0·096	0·101	0·097
$\quad$ { κ =	320	323	322	327	324	325	325
K_1 { H =	0·222	0·227	0·225	0·294	0·291	0·293	0·293
$\quad$ { κ =	345	345	345	340	338	342	340
K_2 { H =	0·071	0·082	0·077	0·121	0·120	0·094	0·112
$\quad$ { κ =	281	291	286	278	276	286	280
P { H =	0·083	0·085	0·084	0·093	0·094	0·103	0·097
$\quad$ { κ =	342	350	346	341	341	350	344
J { H =	0·006	0·016	0·011	0·029	0·012	0·021	0·021
$\quad$ { κ =	348	307	328	337	314	304	318

Table II.

Negapatam.   *Madras.*

Commence 0 h., December 6.   Commence 0 h., February 1.

Year	1881–2.	1882–3.	Mean.	1880–1.	1881–2.	1882–3.	Mean.
Q $\begin{cases} H = \\ \kappa = \end{cases}$	0·007 143	0·007 219	0·007 181	0·004 140	0·003 150	0·009 43	0·005 111
L $\begin{cases} H = \\ \kappa = \end{cases}$	0·022 278	0·031 279	0·027 279	0·037 278	0·017 335	0·054 310	0·036 307
N $\begin{cases} H = \\ \kappa = \end{cases}$	0·164 243	0·152 246	0·158 244	0·246 243	0·235 240	0·238 242	0·240 242
λ $\begin{cases} H = \\ \kappa = \end{cases}$	0·025 234	0·005 229	0·015 231	0·027 348	0·025 283	0·035 268	0·029 299
ν $\begin{cases} H = \\ \kappa = \end{cases}$	0·048 228	0·047 206	0·048 217	0·053 209	0·007 287	0·072 318	0·044 271
μ $\begin{cases} H = \\ \kappa = \end{cases}$	0·018 132	0·024 113	0·021 122	0·046 184	0·048 167	0·030 183	0·041 178
R $\begin{cases} H = \\ \kappa = \end{cases}$	....	0·031 349	0·031 349	....	0·016 103	....	0·016 103
T $\begin{cases} H = \\ \kappa = \end{cases}$	....	0·050 255	0·050 255	....	0·056 257	....	0·056 257
MS $\begin{cases} H = \\ \kappa = \end{cases}$	0·019 96	0·017 96	0·018 96	0·004 177	0·001 54	0·004 280	0·003 170
2MS $\begin{cases} H = \\ \kappa = \end{cases}$	0·007 161	0·006 216	0·007 188	0·020 228	0·022 220	0·023 178	0·022 209
Mm $\begin{cases} H = \\ \kappa = \end{cases}$	0·081 345	0·032 310	0·057 328	0·040 41	0·047 130	0·055 68	0·047 80
Mf $\begin{cases} H = \\ \kappa = \end{cases}$	0·061 35	0·017 338	0·039 7	0·030 5	0·050 349	0·055 25	0·045 6
MSf $\begin{cases} H = \\ \kappa = \end{cases}$	0·084 2	0·097 13	0·091 7	0·001 84	0·034 46	0·021 44	0·019 58
Sa $\begin{cases} H = \\ \kappa = \end{cases}$	0·543 231	0·522 233	0·533 232	0·372 201	0·335 225	0·449 211	0·385 212
Ssa $\begin{cases} H = \\ \kappa = \end{cases}$	0·400 126	0·316 134	0·358 130	0·275 120	0·383 149	0·257 115	0·305 128

Table II.

Vizagapatam.

Commence 0 h., February 3.

Year	1879–80.	1880–1.	1881–2.	1882–3.	Mean.
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·028 101	0·047 77	0·035 92	0·096 1	0·052 68
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·674 280	0·659 286	0·651 286	0·641 290	0·656 285
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·001 0	0·007 77	0·006 50	0·006 60	0·005 47
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·001 124	0·001 128	0·001 214	0·002 215	0·001 170
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·001 73	0·001 103	0·003 61	0·001 78	0·002 79
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·023 355	0·021 23	0·001 199	0·004 242	0·012 295
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	1·532 249	1·460 253	1·459 254	1·439 255	1·473 253
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·007 332	0·001 208	0·006 41	0·008 14	0·006 329
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·014 310	0·014 331	0·015 339	0·018 342	0·015 331
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·003 144	0·004 78	0·005 30	0·008 35	0·005 72
$M_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·004 174	0·002 214	0·002 243	0·005 206	0·003 209
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·139 330	0·140 332	0·144 333	0·142 329	0·141 331
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·371 338	0·364 342	0·366 342	0·335 346	0·359 342
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·179 270	0·157 274	0·168 285	0·306 278	0·203 277
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·112 336	0·104 346	0·117 346	0·049 329	0·096 339
$J \begin{cases} H = \\ \kappa = \end{cases}$	0·035 328	0·027 356	0·014 314	0·024 351	0·025 337

Table II.

Vizagapatam.

Commence 0 h., February 3.

Year	1879–80.	1880–1.	1881–2.	1882–3.	Mean.
Q $\{$ H =	0·010	0·007	0·004	0·014	0·009
$\{$ κ =	20	277	306	336	325
L $\{$ H =	0·049	0·044	0·027	0·088	0·052
$\{$ κ =	257	245	297	217	254
N $\{$ H =	0·355	0·300	0·291	0·309	0·314
$\{$ κ =	243	250	251	242	246
λ $\{$ H =	0·021	0·019	0·022	0·024	0·022
$\{$ κ =	201	332	244	278	264
ν $\{$ H =	0·114	0·055	0·002	0·127	0·075
$\{$ κ =	244	199	72	283	199
μ $\{$ H =	0·030	0·026	0·016	0·034	0·027
$\{$ κ =	234	259	218	326	259
R $\{$ H =	......	0·015	......	0·039	0·027
$\{$ κ =	......	130	......	246	188
T $\{$ H =	......	0·021	......	0·080	0·051
$\{$ κ =	......	336	......	189	263
MS $\{$ H =	0·007	0·010	0·014	0·015	0·012
$\{$ κ =	345	20	20	357	5
2MS $\{$ H =	0·008	0·010	0·015	0·016	0·012
$\{$ κ =	210	292	250	148	225
Mm $\{$ H =	0·022	0·078	0·049	0·072	0·055
$\{$ κ =	22	53	104	35	54
Mf $\{$ H =	0·030	0·051	0·061	0·027	0·042
$\{$ κ =	23	340	2	2	2
MSf $\{$ H =	0·076	0·021	0·038	0·048	0·046
$\{$ κ =	22	13	314	102	23
Sa $\{$ H =	0·740	0·833	0·577	0·707	0·714
$\{$ κ =	190	173	189	175	182
Ssa $\{$ H =	0·301	0·328	0·458	0·241	0·332
$\{$ κ =	89	126	140	101	114

Table II.

False Point.   *Dublat.*

Commence 0 h., May 1.   Commence 0 h., April 22.

Year	1881–2.	1882–3.	Mean.	1881–2.	1882–3.	Mean.
S_1 $H =$ $\kappa =$	0·006 325	0·024 48	0·015 6	0·044 99	0·050 121	0·047 110
S_2 $H =$ $\kappa =$	1·005 302	1·030 304	1·018 303	2·053 327	2·163 326	2·108 327
S_4 $H =$ $\kappa =$	0·007 331	0·008 327	0·008 329	0·025 202	0·011 220	0·018 211
S_6 $H =$ $\kappa =$	0·003 153	0·003 185	0·003 169	0·002 120	0·005 78	0·004 99
S_8 $H =$ $\kappa =$	0·003 219	0·003 261	0·003 240	0·004 116	0·007 110	0·006 113
M_1 $H =$ $\kappa =$	0·009 66	0·008 355	0·009 30	0·008 345	0·007 97	0·008 41
M_2 $H =$ $\kappa =$	2·247 269	2·253 271	2·250 270	4·623 290	4·596 290	4·610 290
M_3 $H =$ $\kappa =$	0·012 34	0·016 27	0·014 30	0·049 131	0·043 135	0·046 133
M_4 $H =$ $\kappa =$	0·035 224	0·041 236	0·038 230	0·101 143	0·089 145	0·095 144
M_6 $H =$ $\kappa =$	0·006 80	0·014 47	0·010 63	0·014 275	0·013 236	0·014 255
M_8 $H =$ $\kappa =$	0·003 229	0·002 262	0·003 246	0·014 316	0·009 273	0·012 294
O $H =$ $\kappa =$	0·175 335	0·179 335	0·177 335	0·181 332	0·197 335	0·189 334
K_1 $H =$ $\kappa =$	0·408 344	0·407 346	0·408 345	0·498 353	0·488 350	0·493 352
K_2 $H =$ $\kappa =$	0·268 296	0·241 297	0·255 297	0·573 310	0·618 325	0·596 318
P $H =$ $\kappa =$	0·133 349	0·157 340	0·145 344	0·158 336	0·151 351	0·155 343
J $H =$ $\kappa =$	0·021 306	0·030 319	0·026 312	0·031 352	0·016 296	0·024 324

Table II.

| | | *False Point.* | | | *Dublat.* | |
| | | Commence 0 h., May 1. | | | Commence 0 h., April 22. | |

Year	1881–2.	1882–3.	Mean.	1881–2.	1882–3.	Mean.
Q $\{$ H = κ =	0·004 307	0·017 340	0·011 324	0·010 306	0·008 1	0·009 333
L $\{$ H = κ =	0·068 281	0·050 227	0·059 254	0·175 291	0·158 292	0·167 291
N $\{$ H = κ =	0·471 265	0·481 268	0·476 267	1·041 285	0·852 286	0·947 286
λ $\{$ H = κ =	0·045 277	0·081 83	0·063 180	0·298 339	0·139 293	0·219 316
ν $\{$ H = κ =	0·163 247	0·120 241	0·142 244	0·271 261	0·192 240	0·232 251
μ $\{$ H = κ =	0·070 266	0·080 280	0·075 273	0·218 10	0·111 19	0·165 15
R $\{$ H = κ =	....	0·034 217	0·034 217	....	0·219 289	0·219 289
T $\{$ H = κ =	....	0·017 149	0·017 149	....	0·137 299	0·137 299
MS $\{$ H = κ =	0·039 272	0·042 275	0·041 274	0·094 171	0·059 139	0·077 155
2MS $\{$ H = κ =	0·019 196	0·014 177	0·017 187	0·097 195	0·046 227	0·072 211
Mm $\{$ H = κ =	0·053 53	0·072 58	0·063 55	0·045 29	0·035 125	0·040 77
Mf $\{$ H = κ =	0·061 37	0·073 33	0·067 35	0·056 61	0·039 71	0·048 66
MSf $\{$ H = κ =	0·041 279	0·059 73	0·050 356	0·049 278	0·077 75	0·063 356
Sa $\{$ H = κ =	0·746 166	0·840 166	0·793 166	0·796 147	1·003 154	0·900 150
Ssa $\{$ H = κ =	0·364 142	0·210 149	0·287 146	0·234 162	0·182 110	0·208 136

Table II.

Diamond Harbour.   *Kidderpore.*

Commence 0 h., April 4.   Commence 0 h., March 22.

Year	1881–2.	1882–3.	Mean.	1881–2.	1882–3.	Mean.
S_1 { H =	0·082	0·088	0·085	0·094	0·088	0·091
$\quad$ { κ =	156	147	152	197	190	193
S_2 { H =	2·215	2·288	2·252	1·427	1·508	1·468
$\quad$ { κ =	26	25	26	102	101	101
S_4 { H =	0·117	0·122	0·120	0·066	0·084	0·075
$\quad$ { κ =	328	323	326	126	111	119
S_6 { H =	0·013	0·013	0·013	0·006	0·004	0·005
$\quad$ { κ =	266	235	251	266	332	299
S_8 { H =	0·002	0·004	0·003	0·006	0·009	0·008
$\quad$ { κ =	305	42	353	298	323	311
M_1 { H =	0·020	0·020	0·020	0·012	0·013	0·013
$\quad$ { κ =	88	103	95	112	202	157
M_2 { H =	5·175	5·179	5·177	3·593	3·660	3·627
$\quad$ { κ =	345	344	344	59	58	58
M_3 { H =	0·042	0·028	0·035	0·012	0·018	0·015
$\quad$ { κ =	220	225	223	335	328	331
M_4 { H =	0·756	0·734	0·745	0·734	0·719	0·727
$\quad$ { κ =	246	245	246	39	35·	37
M_6 { H =	0·156	0·148	0·152	0·158	0·160	0·159
$\quad$ { κ =	106	105	106	323	315	319
M_8 { H =	0·065	0·058	0·062	0·074	0·082	0·078
$\quad$ { κ =	347	343	345	276	263	270
O { H =	0·237	0·230	0·234	0·228	0·211	0·220
$\quad$ { κ =	344	346	345	22	20	21
K_1 { H =	0·499	0·492	0·496	0·390	0·387	0·389
$\quad$ { κ =	15	14	14	58	54	56
K_2 { H =	0·667	0·644	0·656	0·439	0·431	0·435
$\quad$ { κ =	20	27	23	90	101	96
P { H =	0·176	0·174	0·175	0·146	0·142	0·144
$\quad$ { κ =	6	12	9	42	52	47
J { H =	0·029	0·033	0·031	0·016	0·012	0·014
$\quad$ { κ =	299	340	320	355	298	327

Table II.

Diamond Harbour.   *Kidderpore.*

Commence 0 h., April 4.   Commence 0 h., March 22.

Year	1881–2.	1882–3.	Mean.	1881–2.	1882–3.	Mean.
Q $\{$ H =	0·024	0·036	0·030	0·039	0·039	0·039
κ =	9	10	9	358	20	9
L $\{$ H =	0·174	0·347	0·261	0·201	0·173	0·187
κ =	357	344	351	86	62	74
N $\{$ H =	0·988	0·914	0·951	0·677	0·599	0·638
κ =	339	340	339	48	46	47
λ $\{$ H =	0·171	0·058	0·115	0·126	0·075	0·101
κ =	19	296	337	131	84	107
ν $\{$ H =	0·420	0·186	0·303	0·323	0·152	0·238
κ =	294	284	289	358	349	353
μ $\{$ H =	0·272	0·333	0·303	0·224	0·260	0·242
κ =	79	90	85	174	190	182
R $\{$ H =	......	0·216	0·216	......	0·167	0·167
κ =	......	10	10	......	77	77
T $\{$ H =	......	0·078	0·078	......	0·147	0·147
κ =	......	55	55	......	107	107
MS $\{$ H =	0·687	0·702	0·695	0·646	0·643	0·645
κ =	286	284	285	82	80	81
2SM $\{$ H =	0·095	0·053	0·074	0·084	0·086	0·085
κ =	251	290	271	355	9	2
Mm $\{$ H =	0·147	0·057	0·102	0·316	0·172	0·244
κ =	12	351	1	0	341	351
Mf $\{$ H =	0·157	0·142	0·150	0·301	0·293	0·297
κ =	36	41	39	41	36	38
MSf $\{$ H =	0·401	0·501	0·451	0·829	0·920	0·875
κ =	26	40	33	35	43	39
Sa $\{$ H =	1·011	1·189	1·100	2·809	2·670	2·740
κ =	140	147	143	157	157	157
Ssa $\{$ H =	0·023	0·109	0·066	0·935	0·708	0·822
κ =	64	77	71	205	334	269

Table II.

(a) *Elephant Point.*   *Rangoon.*

(a) Commence 0 h., May 24.   Commence 0 h., March 1.

(a)

Year	1880–1.	1880–1.	1881–2.	1882–3.	Mean.
S_1 { H = { κ =	0·113 79	0·120 141	0·123 129	0·097 129	0·113 133
S_2 { H = { κ =	2·337 143	2·009 169	2·003 170	2·025 171	2·012 170
S_4 { H = { κ =	0·037 162	0·076 262	0·088 256	0·079 258	0·081 259
S_6 { H = { κ =	0·021 94	0·011 42	0·009 39	0·011 63	0·010 48
S_8 { H = { κ =	0·008 60	0·006 119	0·003 117	0·005 122	0·005 120
M_1 { H = { κ =	0·019 88	0·049 151	0·037 236	0·013 163	0·033 183
M_2 { H = { κ =	5·870 103	5·539 130	5·519 132	5·577 131	5·545 131
M_3 { H = { κ =	0·025 146	0·009 238	0·016 154	0·038 142	0·021 178
M_4 { H = { κ =	0·079 46	0·388 167	0·424 171	0·418 168	0·410 169
M_6 { H = { κ =	0·205 349	0·236 85	0·227 89	0·235 87	0·233 87
M_8 { H = { κ =	0·031 322	0·074 92	0·083 103	0·087 96	0·081 97
O { H = { κ =	0·349 356	0·289 30	0·294 27	0·300 28	0·294 28
K_1 { H = { κ =	0·807 18	0·674 35	0·682 35	0·653 36	0·670 35
K_2 { H = { κ =	0·401 91	0·535 168	0·576 173	0·598 165	0·570 169
P { H = { κ =	0·199 33	0·134 61	0·148 52	0·166 53	0·149 55
J { H = { κ =	0·110 61	0·049 70	0·023 91	0·018 298	0·030 33

Table II.

(*a*) *Elephant Point.* *Rangoon.*

(*a*) Commence 0 h., May 24. Commence 0 h., March 1.

(*a*)

Year	1880–1.	1880–1.	1881–2.	1882–3.	Mean.
Q $\begin{cases} H = \\ \kappa = \end{cases}$	0·042 336	0·028 9	0·024 29	0·028 56	0·027 31
L $\begin{cases} H = \\ \kappa = \end{cases}$	0·346 109	0·368 153	0·327 158	0·525 160	0·407 157
N $\begin{cases} H = \\ \kappa = \end{cases}$	1·543 80	1·045 117	0·949 120	0·977 115	0·990 117
λ $\begin{cases} H = \\ \kappa = \end{cases}$	0·659 145	0·299 174	0·290 184	0·181 152	0·257 170
ν $\begin{cases} H = \\ \kappa = \end{cases}$	0·681 209	0·479 94	0·288 75	0·184 130	0·317 100
μ $\begin{cases} H = \\ \kappa = \end{cases}$	0·356 279	0·497 289	0·508 295	0·536 286	0·514 290
R $\begin{cases} H = \\ \kappa = \end{cases}$	....	....	0·117 66	....	0·117 66
T $\begin{cases} H = \\ \kappa = \end{cases}$	....	....	0·290 128	....	0·290 128
MS $\begin{cases} H = \\ \kappa = \end{cases}$	0·135 67	0·349 207	0·415 212	0·394 210	0·386 210
2SM $\begin{cases} H = \\ \kappa = \end{cases}$	0·042 84	0·173 46	0·155 54	0·153 61	0·160 54
Mm $\begin{cases} H = \\ \kappa = \end{cases}$	0·145 6	0·296 21	0·230 9	0·182 39	0·236 23
Mf $\begin{cases} H = \\ \kappa = \end{cases}$	0·098 310	0·168 35	0·223 27	0·233 39	0·208 34
MSf $\begin{cases} H = \\ \kappa = \end{cases}$	0·059 273	0·515 45	0·559 52	0·588 49	0·554 49
Sa $\begin{cases} H = \\ \kappa = \end{cases}$	0·930 146	1·600 144	1·415 153	1·444 152	1·486 150
Ssa $\begin{cases} H = \\ \kappa = \end{cases}$	0·261 198	0·193 306	0·012 315	0·174 3	0·126 328

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Table II.

Amherst.   *Moulmein.*

Commence 0 h., August 5.   Commence 0 h., April 17.

N.B.—The MS. gives H of $K_2 = 1\cdot771$ for 1880–1; an obvious mistake. The mean
has been corrected.

Year	1880–1.	1881–2.	1882–3.	Mean.	1880–1.	1881–2.	1 882–3 .	Mean.
S_1 $\{$ H =	0·426	0·143	0·096	0·222	0·095	0·099	0·095	0·096
κ =	178	149	97	141	146	155	148	149
S_2 $\{$ H =	2·851	2·705	2·750	2·769	1·400	1·344	1·343	1·362
κ =	109	101	105	105	148	145	150	148
S_4 $\{$ H =	0·095	0·118	0·104	0·106	0·068	0·069	0·065	0·067
κ =	147	102	117	122	230	225	231	229
S_6 $\{$ H =	0·022	0·004	0·009	0·012	0·006	0·006	0·004	0·005
κ =	222	221	119	187	178	187	185	183
S_8 $\{$ H =	0·009	0·006	0·009	0·008	0·002	0·001	0·002	0·002
κ =	209	348	269	276	164	252	218	211
M_1 $\{$ H =	0·041	0·021	0·035	0·032	0·034	0·019	0·002	0·018
κ =	192	273	300	255	128	101	183	138
M_2 $\{$ H =	6·230	6·081	6·389	6·233	3·884	3·698	3·756	3·779
κ =	70	68	68	69	112	112	115	113
M_3 $\{$ H =	0·034	0·003	0·019	0·019	0·023	0·031	0·020	0·025
κ =	287	224	273	261	274	215	139	209
M_4 $\{$ H =	0·273	0·423	0·355	0·350	0·926	0·880	0·897	0·901
κ =	60	51	41	51	169	170	174	171
M_6 $\{$ H =	0·070	0·146	0·139	0·118	0·105	0·107	0·095	0·102
κ =	257	248	251	252	200	198	201	200
M_8 $\{$ H =	0·006	0·014	0·021	0·014	0·034	0·036	0·044	0·038
κ =	282	244	220	249	125	141	134	133
O $\{$ H =	0·310	0·319	0·323	0·317	0·256	0·252	0·252	0·253
κ =	328	339	352	339	44	49	50	48
K_1 $\{$ H =	0·668	0·686	0·744	0·699	0·452	0·447	0·414	0·438
κ =	3	6	6	5	39	40	42	40
K_2 $\{$ H =	0·771	0·858	0·682	0·770	0·409	0·282	0·316	0·336
κ =	91	81	97	90	151	152	162	155
P $\{$ H =	0·132	0·193	0·207	0·177	0·113	0·144	0·144	0·134
κ =	308	348	354	337	62	61	57	60
J $\{$ H =	0·109	0·083	0·031	0·074	0·038	0·018	0·009	0·022
κ =	13	7	82	34	52	48	222	107

Table II.

Amherst. *Moulmein.*

Commence 0 h., August 5. Commence 0 h., April 17.

Year	1880–1.	1881–2.	1882–3.	Mean.	1880–1.	1881–2.	1882–3.	Mean.
$Q\begin{cases} H = \\ \kappa = \end{cases}$	0·064 325	0·060 321	0·039 322	0·054 322	0·043 53	0·054 55	0·039 53	0·045 53
$L\begin{cases} H = \\ \kappa = \end{cases}$	0·226 112	0·303 120	0·348 103	0·292 112	0·204 134	0·390 155	0·242 129	0·279 139
$N\begin{cases} H = \\ \kappa = \end{cases}$	1·374 60	1·248 51	1·343 51	1·322 54	0·735 97	0·672 106	0·630 102	0·679 102
$\lambda\begin{cases} H = \\ \kappa = \end{cases}$	0·393 113	0·280 65	0·226 178	0·300 119	0·161 152	0·249 182	0·118 162	0·176 165
$\nu\begin{cases} H = \\ \kappa = \end{cases}$	0·426 186	0·283 267	0·566 79	0·425 177	0·314 101	0·215 91	0·169 58	0·233 84
$\mu\begin{cases} H = \\ \kappa = \end{cases}$	0·443 278	0·247 299	0·220 326	0·303 301	0·308 272	0·314 259	0·316 280	0·313 270
$R\begin{cases} H = \\ \kappa = \end{cases}$	....	0·451 252	....	0·451 252	....	0·097 70	....	0·097 70
$T\begin{cases} H = \\ \kappa = \end{cases}$	....	0·841 144	....	0·841 144	....	0·200 110	....	0·200 110
$MS\begin{cases} H = \\ \kappa = \end{cases}$	0·285 90	0·406 80	0·350 76	0·347 82	0·741 210	0·701 209	0·693 214	0·712 211
$2SM\begin{cases} H = \\ \kappa = \end{cases}$	0·188 345	0·150 28	0·115 16	0·151 10	0·127 38	0·137 40	0·109 37	0·124 38
$Mm\begin{cases} H = \\ \kappa = \end{cases}$	....	0·152 43	0·038 52	0·095 48	0·409 3	0·441 17	0·229 21	0·360 14
$Mf\begin{cases} H = \\ \kappa = \end{cases}$	....	0·062 315	0·132 24	0·097 350	0·282 42	0·379 40	0·342 40	0·334 41
$Msf\begin{cases} H = \\ \kappa = \end{cases}$	....	0·080 76	0·029 66	0·055 71	1·088 43	1·097 48	1·146 46	1·110 46
$Sa\begin{cases} H = \\ \kappa = \end{cases}$	....	0·638 150	0·814 130	0·726 140	2·460 145	2·389 153	2·453 149	2·434 149
$Saa\begin{cases} H = \\ \kappa = \end{cases}$	....	0·188 139	0·124 332	0·156 235	0·563 283	0·653 284	0·593 295	0·603 287

Table II.

Port Blair.   *Fort Point, California.*

Commence 0 h., April 19.   Commence 0 h., October 1.

Year	1880–1.	1881–2.	1882–3.	Mean.	1858–9.	1859–60.	1860–1.	Mean.
S_1 { H =	0·028	0·018	0·016	0·021	0·015	......	......	0·015
$\quad$ { κ =	49	35	31	38	212	......	......	212
S_2 { H =	0·966	0·978	0·959	0·968	0·407	0·380	0·382	0·390
$\quad$ { κ =	316	313	315	315	334	336	336	336
S_4 { H =	0·003	0·001	0·004	0·003				
$\quad$ { κ =	107	86	59	84				
S_6 { H =	0·002	0·002	0·002	0·002				
$\quad$ { κ =	152	99	142	131				
S_8 { H =	0·002	0·002	0·001	0·002				
$\quad$ { κ =	98	88	53	80				
M_1 { H =	0·016	0·007	0·008	0·010	0·034	0·037	0·044	0·038
$\quad$ { κ =	23	254	238	291	98	273	139	170
M_2 { H =	2·042	2·014	2·010	2·022	1·722	1·659	1·685	1·689
$\quad$ { κ =	279	277	278	278	332	333	331	332
M_3 { H =	0·004	0·011	0·007	0·007				
$\quad$ { κ =	20	11	16	16				
M_4 { H =	0·003	0·011	0·011	0·008	0·066	0·074	0·072	0·071
$\quad$ { κ =	167	128	158	151	26	30	15	24
M_6 { H =	0·004	0·002	0·000	0·002				
$\quad$ { κ =	342	206	42	317				
M_8 { H =	0·003	0·002	0·002	0·002				
$\quad$ { κ =	19	70	120	70				
O { H =	0·153	0·162	0·166	0·160	0·769	0·756	0·814	0·780
$\quad$ { κ =	299	304	302	302	89	89	85	87
K_1 { H =	0·403	0·397	0·391	0·397	1·217	1·209	1·232	1·219
$\quad$ { κ =	326	327	327	327	106	107	107	107
K_2 { H =	0·286	0·296	0·264	0·282	0·139	0·143	0·122	0·135
$\quad$ { κ =	314	308	310	311	336	328	325	330
P { H =	0·130	0·137	0·134	0·134	0·367	0·366	0·387	0·373
$\quad$ { κ =	324	327	326	326	107	106	104	105
J { H =	0·038	0·030	0·014	0·027	0·072	0·034	0·053	0·053
$\quad$ { κ =	316	324	333	325	130	127	105	121

Table II.

Port Blair.				*Fort Point, California.*			
Commence 0 h., April 19.				Commence 0 h., October 1.			

Year	1880–1.	1881–2.	1882–3.	Mean.	1858–9.	1859–60.	1860–1.	Mean.
Q $\begin{cases} H = \\ \kappa = \end{cases}$	0·023 / 236	0·027 / 242	0·023 / 233	0·024 / 237	0·147 / 78	0·094 / 54	0·123 / 90	0·121 / 74
L $\begin{cases} H = \\ \kappa = \end{cases}$	0·059 / 269	0·098 / 290	0·046 / 258	0·068 / 272	0·053 / 300	0·060 / 18	0·064 / 335	0·059 / 338
N $\begin{cases} H = \\ \kappa = \end{cases}$	0·413 / 273	0·392 / 273	0·391 / 277	0·399 / 274	0·406 / 305	0·357 / 307	0·359 / 305	0·374 / 305
λ $\begin{cases} H = \\ \kappa = \end{cases}$	0·035 / 229	0·046 / 311	0·047 / 301	0·043 / 280	0·038 / 9	0·029 / 338	0·012 / 326	0·026 / 345
ν $\begin{cases} H = \\ \kappa = \end{cases}$	0·148 / 294	0·137 / 254	0·079 / 214	0·121 / 254	0·107 / 288	0·040 / 274	0·045 / 352	0·064 / 305
μ $\begin{cases} H = \\ \kappa = \end{cases}$	0·094 / 288	0·089 / 298	0·074 / 291	0·086 / 292	0·028 / 257	0·032 / 210	0·026 / 214	0·029 / 227
R $\begin{cases} H = \\ \kappa = \end{cases}$	...... /	0·020 / 326	...... /	0·020 / 326	...... /	0·008 / 63	...... /	0·008 / 63
T $\begin{cases} H = \\ \kappa = \end{cases}$	...... /	0·099 / 313	...... /	0·099 / 313	...... /	0·014 / 198	...... /	0·014 / 198
MS $\begin{cases} H = \\ \kappa = \end{cases}$	0·004 / 153	0·016 / 206	0·007 / 284	0·009 / 215	0·026 / 23	0·034 / 14	0·032 / 25	0·031 / 21
2SM $\begin{cases} H = \\ \kappa = \end{cases}$	0·021 / 149	0·020 / 168	0·028 / 146	0·023 / 154				
Mm $\begin{cases} H = \\ \kappa = \end{cases}$	0·020 / 13	0·017 / 26	0·005 / 21	0·014 / 20				
Mf $\begin{cases} H = \\ \kappa = \end{cases}$	0·056 / 356	0·067 / 15	0·048 / 17	0·057 / 9				
MSf $\begin{cases} H = \\ \kappa = \end{cases}$	0·019 / 168	0·007 / 4	0·018 / 9	0·015 / 61				
Sa $\begin{cases} H = \\ \kappa = \end{cases}$	0·299 / 163	0·062 / 133	0·251 / 156	0·204 / 150				
Ssa $\begin{cases} H = \\ \kappa = \end{cases}$	0·106 / 165	0·134 / 197	0·110 / 170	0·117 / 177				

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Table II.

(a) *San Diego.* (b) *Port Leopold.* (c) *Beechey Island.* (d) *Cat Island.* (e) *Toulon.*

(a) Com. 0 h., Jan. 1. (b) Com. 0 h., Nov. 1, 1848, to July 31, 1849. (c) Com. 0 h., Nov. 2, 1858, to Feb. 28, 1859. (d) Com. 0 h., Jan. 1. (e) Com. 0 h., Jan. 1.

	(a)	(a)	(a)	(b)	(c)	(d)	(e)
Year	1860.	1861.	Mean.	1848–9.	1858–9.	1848.	1853.
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·030 229	0·025 246	0·028 238	0·031 27	....	0·044 10	0·010 186
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·697 273	0·693 275	0·695 274	0·643 29	0·686 34	0·068 24	0·090 250
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·007 187	0·005 221	0·006 204	0·007 257	....	....	0·002 298
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$							
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$							
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·046 115	0·051 98	0·049 106	0·045 230	....	0·007 26	0·010 319
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	1·718 275	1·712 277	1·715 276	2·001 338	1·996 347	0·116 11	0·190 252
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·007 17	0·007 21	0·007 19	....	....	....	0·004 9
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·028 205	0·027 200	0·028 203	0·015 202	0·024 268	....	0·011 349
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·010 88	0·013 80	0·012 84	....	....	....	0·002 152
$M_8 \begin{cases} H = \\ \kappa = \end{cases}$	....	....	....	....	....	....	0·001 146
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·694 77	0·698 78	0·696 78	0·443 164	0·488 162	0·479 315	0·059 302
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	1·097 94	1·095 95	1·096 94	0·899 216	0·901 243	0·525 325	0·116 3
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·210 260	0·203 267	0·207 263	0·175 29	0·151 54	0·028 288	0·024 254
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·352 91	0·361 90	0·357 90	0·216 218	0·215 222	0·156 321	0·041 0
$J \begin{cases} H = \\ \kappa = \end{cases}$	0·068 96	0·100 103	0·084 99	....	....	0·035 297	0·008 15

Table II.

(a) *San Diego.* (b) *Port Leopold.* (c) *Beechey Island.* (d) *Cat Island.* (e) *Toulon.*

(a) Com. 0 h., Jan. 1. (b) Com. 0 h., Nov. 1, 1848, to July 31, 1849. (c) Com. 0 h., Nov. 2, 1858, to Feb. 28, 1859. (d) Com. 0 h., Jan. 1. (e) Com. 0 h., Jan. 1.

		(a)	(a)	(a)	(b)	(c)	(d)	(e)
Year		1860.	1861.	Mean.	1848–9.	1858–9.	1848.	1853.
Q	$H =$	0·129	0·160	0·145	......	......	0·091	0·006
	$\kappa =$	73	77	75	......	......	307	242
L	$H =$	0·033	0·005	0·019	0·044	0·080	0·012	0·007
	$\kappa =$	0	328	344	3	47	33	224
N	$H =$	0·415	0·440	0·428	0·420	0·429	0·026	0·046
	$\kappa =$	258	261	260	306	315	33	240
λ	$H =$	0·069	0·049	0·059	......	......	......	0·003
	$\kappa =$	179	268	224	......	......	......	10
ν	$H =$	0·134	0·070	0·102	......	......	......	0·008
	$\kappa =$	261	233	247	......	......	......	219
μ	$H =$	0·039	0·015	0·027	......	......	......	0·007
	$\kappa =$	244	235	240	......	......	......	219
R	$H =$	......	0·010	0·010				
	$\kappa =$	......	153	153				
T	$H =$	......	0·041	0·041				
	$\kappa =$	......	319	319				
MS	$H =$	0·006	0·012	0·009				
	$\kappa =$	188	191	189				
$2SM$	$H =$							
	$\kappa =$							
Mm	$H =$	......	......	......	......	......	0·094	0·061
	$\kappa =$	......	......	......	......	......	304	228
Mf	$H =$	......	......	......	......	......	0·069	0·045
	$\kappa =$	......	......	......	......	......	134	118
MSf	$H =$	......	......	......	......	...,,	0·095	0·018
	$\kappa =$	......	......	......	......	......	336	53
Sa	$H =$	......	......	......	......	......	0·274	0·157
	$\kappa =$	......	......	......	......	......	145	279
Ssa	$H =$	......	......	......	......	......	0·128	0·090
	$\kappa =$	......	......	......	......	......	35	144

Table II.

(*a*) *Brest.*   (*b*) *Ramsgate.*   (*c*) *West Hartlepool.*

(*a*) Com. 0 h., Jan. 1.   (*b*) Com. 0 h., Jan. 1.   (*c*) Com. 0 h., July 1.

N.B.—English ports referred to G.M.T.

	(*a*)	(*b*)	(*c*)	(*c*)	(*c*)	(*c*)
Year	1875.	1864.	1858–9.	1859–60.	1860–1.	Mean.
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·015 52	0·037 313	0·019 132	0·054 157	0·025 169	0·033 152
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	2·551 138	1·877 33	1·754 141	1·711 138	1·749 138	1·738 139
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	....	0·032 4	0·025 190	0·021 174	0·019 172	0·022 179
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$	....	0·027 27				
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$						
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·004 167	....	0·028 39	0·030 125	0·019 147	0·026 104
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	6·766 100	6·144 341	5·176 99	5·148 99	5·166 97	5·163 98
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·067 2	0·043 56	0·038 122	0·023 105	0·046 127	0·036 118
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·169 85	0·548 243	0·080 103	0·106 117	0·099 107	0·095 109
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·106 325	0·164 127	0·071 50	0·078 55	0·073 46	0·074 50
$M_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·008 203	0·054 54				
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·211 322	0·342 180	0·433 84	0·425 86	0·444 85	0·434 85
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·208 66	0·223 18	0·390 247	0·365 247	0·385 248	0·380 248
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·553 144	0·520 24	0·485 139	0·511 136	0·467 132	0·488 135
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·071 59	0·073 353	0·121 232	0·120 232	0·095 232	0·112 232
$J \begin{cases} H = \\ \kappa = \end{cases}$	....	....	0·031 268	0·026 300	0·027 105	0·028 224

Table II.

(*a*) *Brest.*   (*b*) *Ramsgate.*   (*c*) *West Hartlepool.*

(*a*) Com. 0 h., Jan. 1.   (*b*) Com. 0 h., Jan. 1.   (*c*) Com. 0 h., July 1.

N.B.—English ports referred to G.M.T.

	(*a*)	(*b*)	(*c*)	(*c*)	(*c*)	(*c*)
Year	1875.	1864.	1858–9.	1859–60.	1860–1.	Mean.
Q $\{$ H =	......	......	0·140	0·143	0·160	0·148
$\{$ κ =	......	......	41	31	25	32
L $\{$ H =	0·192	0·447	0·169	0·179	0·253	0·200
$\{$ κ =	101	16	106	140	94	114
N $\{$ H =	1·375	1·084	0·951	0·973	1·040	0·988
$\{$ κ =	83	312	77	70	72	73
λ $\{$ H =	0·059	0·174	0·057	0·110	0·117	0·095
$\{$ κ =	59	351	148	85	115	116
ν $\{$ H =	0·293	0·344	0·115	0·325	0·369	0·270
$\{$ κ =	45	330	75	116	73	88
μ $\{$ H =	0·307	0·251	0·097	0·100	0·057	0·085
$\{$ κ =	92	87	9	346	24	6
R $\{$ H =	......	......	......	......	0·008	0·008
$\{$ κ =	......	......	......	......	158	158
T $\{$ H =	......	......	......	......	0·140	0·140
$\{$ κ =	......	......	......	......	200	200
MS $\{$ H =	......	0·324	0·047	0·040	0·046	0·044
$\{$ κ =	......	127	122	142	115	126
2SM $\{$ H =	......	0·141	0·034	0·034	0·009	0·026
$\{$ κ =	......	262	315	29	226	310
Mm $\{$ H =	0·038	0·029	0·085	0·148	0·147	0·127
$\{$ κ =	328	45	24	176	79	93
Mf $\{$ H =	0·069	0·044	0·037	0·040	0·060	0·046
$\{$ κ =	76	288	200	237	178	205
MSf $\{$ H =	0·290	0·094	0·135	0·134	0·143	0·137
$\{$ κ =	52	206	70	56	53	59
Sa $\{$ H =	0·261	0·127	0·217	0·366	0·213	0·265
$\{$ κ =	234	181	258	200	200	219
Ssa $\{$ H =	0·071	0·075	0·004	0·138	0·149	0·097
$\{$ κ =	93	288	275	106	287	223

Table II.

Portland Breakwater.

Commence 0 h., January 1.

N.B.—Referred to G.M.T.

Year	1851.	1857.	1866.	1870.	Mean.
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·074 84	0·031 98	0·026 91	0·015 83	0·037 89
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	1·076 243	1·076 247	1·090 245	1·055 241	1·074 244
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·012 193	0·010 185	0·016 168	0·010 196	0·012 186
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$					
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$					
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·011 317	0·004 184	0·030 278	0·013 32	0·015 292
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	2·109 193	2·104 197	1·911 195	2·067 192	2·048 194
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·029 172	0·045 195	0·045 188	0·026 166	0·036 180
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·440 29	0·535 42	0·439 31	0·456 29	0·468 32
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·211 67	0·217 79	0·195 68	0·203 65	0·207 70
$M_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·013 54	0·017 46	0·009 40	0·009 57	0·012 49
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·165 351	0·162 357	0·156 351	0·168 353	0·163 353
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·283 113	0·292 116	0·295 114	0·308 114	0·295 114
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·312 238	0·292 243	0·316 234	0·282 236	0·301 237
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·096 111	0·118 108	0·108 105	0·108 108	0·108 108
$J \begin{cases} H = \\ \kappa = \end{cases}$					

Table II.

Portland Breakwater.

Commence 0 h., January 1.

N.B.—Referred to G.M.T.

Year	1851.	1857.	1866.	1870.	Mean.
Q $\begin{cases} H = \\ \kappa = \end{cases}$					
L $\begin{cases} H = \\ \kappa = \end{cases}$	0·227 144	0·105 98	0·142 109	0·208 95	0·171 111
N $\begin{cases} H = \\ \kappa = \end{cases}$	0·465 184	0·462 186	0·499 186	0·483 184	0·477 185
λ $\begin{cases} H = \\ \kappa = \end{cases}$	0·103 113	0·058 109	0·080 134	0·089 112	0·083 117
ν $\begin{cases} H = \\ \kappa = \end{cases}$	0·093 196	0·125 119	0·121 109	0·121 135	0·115 140
μ $\begin{cases} H = \\ \kappa = \end{cases}$	0·377 197	0·401 199	0·350 193	0·367 193	0·374 196
R $\begin{cases} H = \\ \kappa = \end{cases}$					
T $\begin{cases} H = \\ \kappa = \end{cases}$					
MS $\begin{cases} H = \\ \kappa = \end{cases}$	0·261 86	0·276 94	0·253 90	0·279 91	0·267 90
2SM $\begin{cases} H = \\ \kappa = \end{cases}$	0·050 351	0·072 6	0·062 348	0·050 346	0·059 353
Mm $\begin{cases} H = \\ \kappa = \end{cases}$					
Mf $\begin{cases} H = \\ \kappa = \end{cases}$					
MSf $\begin{cases} H = \\ \kappa = \end{cases}$					
Sa $\begin{cases} H = \\ \kappa = \end{cases}$					
Ssa $\begin{cases} H = \\ \kappa = \end{cases}$					

Table II.

Liverpool.

Commence 0 h., September 1.

N.B.—Referred to G.M.T.

Year	1857–8.	1858–9.	1859–60.	Mean.
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·045 70	0·070 60	0·084 57	0·066 62
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	3·215 12	3·312 11	3·194 10	3·240 11
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·061 322	0·060 330	0·048 295	0·056 316
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$				
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$				
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·015 303	0·042 314	0·004 159	0·020 258
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	10·033 327	10·136 327	10·130 326	10·100 326
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·111 331	0·103 317	0·159 324	0·124 324
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·737 221	0·700 220	0·668 225	0·702 222
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·202 344	0·208 352	0·224 348	0·211 348
$M_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·067 264	0·092 283	0·073 266	0·077 271
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·374 45	0·356 42	0·400 42	0·377 43
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·354 195	0·362 197	0·357 189	0·358 194
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·904 9	1·001 9	0·912 3	0·939 7
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·125 192	0·134 196	0·131 189	0·130 192
$J \begin{cases} H = \\ \kappa = \end{cases}$				

Table II.

Liverpool.

Commence 0 h., September 1.

N.B.—Referred to G.M.T.

Year	1857–8.	1858–9.	1859–60.	Mean.
Q $\begin{cases} H = \\ \kappa = \end{cases}$				
L $\begin{cases} H = \\ \kappa = \end{cases}$	0·408 330	0·681 4	0·530 342	0·540 345
N $\begin{cases} H = \\ \kappa = \end{cases}$	1·930 304	1·819 310	2·019 306	1·923 306
λ $\begin{cases} H = \\ \kappa = \end{cases}$	0·424 322	0·233 316	0·120 13	0·259 337
ν $\begin{cases} H = \\ \kappa = \end{cases}$	0·769 308	0·651 285	0·291 263	0·570 285
μ $\begin{cases} H = \\ \kappa = \end{cases}$	0·308 33	0·241 44	0·323 36	0·291 38
R $\begin{cases} H = \\ \kappa = \end{cases}$	....	0·101 46	0·082 46	0·092 46
T $\begin{cases} H = \\ \kappa = \end{cases}$	....	0·349 348	0·121 317	0·235 333
MS $\begin{cases} H = \\ \kappa = \end{cases}$	0·454 271	0·361 267	0·397 272	0·404 270
2SM $\begin{cases} H = \\ \kappa . = \end{cases}$	0·140 206	0·165 216	0·151 228	0·152 216
Mm $\begin{cases} H = \\ \kappa = \end{cases}$	0·053 289	0·223 32	0·166 173	0·147 165
Mf $\begin{cases} H = \\ \kappa = \end{cases}$	0·064 175	0·027 159	0·018 89	0·036 141
MSf $\begin{cases} H = \\ \kappa = \end{cases}$	0·071 111	0·021 324	0·081 302	0·058 246
Sa $\begin{cases} H = \\ \kappa = \end{cases}$	0·359 210	0·284 259	0·353 213	0·332 227
Ssa $\begin{cases} H = \\ \kappa = \end{cases}$	0·090 144	0·104 270	0·190 112	0·128 175

Table II.

Liverpool.

Commence 0 h., January 23.

N.B.—Referred to G.M.T.

Year	1866–7.	1867–8.	1868–9.	1869–70.	Mean.
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·047 39	0·035 66	0·040 101	0·028 124	0·038 83
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	3·130 12	3·099 11	3·122 12	3·052 14	3·101 12
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·048 314	0·068 327	0·064 298	0·051 313	0·058 313
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$					
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$					
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·035 304	0·023 261	0·049 19	0·048 39	0·039 336
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	9·901 326	9·906 326	9·807 327	9·911 328	9·881 327
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·081 336	0·097 327	0·111 323	0·098 311	0·097 324
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·711 225	0·673 222	0·659 221	0·688 225	0·683 223
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·184 344	0·174 347	0·172 350	0·205 358	0·184 350
$M \begin{cases} H = \\ \kappa = \end{cases}$	0·058 283	0·058 279	0·059 291	0·070 287	0·061 285
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·379 41	0·331 41	0·398 39	0·357 36	0·366 40
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·372 192	0·332 197	0·344 194	0·362 196	0·353 195
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·846 10	1·021 9	0·935 3	0·933 7	0·934 7
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·141 178	0·136 199	0·133 174	0·094 167	0·126 180
$J \begin{cases} H = \\ \kappa = \end{cases}$					

Table II.

Liverpool.

Commence 0 h., January 23.

N.B.—Referred to G.M.T.

Year	1866–7.	1867–8.	1868–9.	1869–70.	Mean.
Q $\begin{cases} H = \\ \kappa = \end{cases}$					
L $\begin{cases} H = \\ \kappa = \end{cases}$	0·550 296	0·491 331	0·476 347	0·565 337	0·521 328
N $\begin{cases} H = \\ \kappa = \end{cases}$	2·083 302	1·845 308	1·774 306	1·848 303	1·888 305
λ $\begin{cases} H = \\ \kappa = \end{cases}$	0·228 356	0·209 0	0·192 317	0·187 310	0·204 336
ν $\begin{cases} H = \\ \kappa = \end{cases}$	0·692 279	0·487 267	0·138 310	0·675 331	0·498 297
μ $\begin{cases} H = \\ \kappa = \end{cases}$	0·238 33	0·212 31	0·242 62	0·220 36	0·228 41
R $\begin{cases} H = \\ \kappa = \end{cases}$					
T $\begin{cases} H = \\ \kappa = \end{cases}$					
MS $\begin{cases} H = \\ \kappa = \end{cases}$	0·447 270	0·400 271	0·395 268	0·387 271	0·407 270
2SM $\begin{cases} H = \\ \kappa = \end{cases}$	0·134 222	0·112 225	0·136 225	0·118 235	0·125 227
Mm $\begin{cases} H = \\ \kappa = \end{cases}$	0·064 260	....	....	....	0·064 260
Mf $\begin{cases} H = \\ \kappa = \end{cases}$	0·057 344	....	....	....	0·057 344
MSf $\begin{cases} H = \\ \kappa = \end{cases}$	0·051 68	....	....	....	0·051 68
Sa $\begin{cases} H = \\ \kappa = \end{cases}$	0·452 272	....	....	....	0·452 272
Ssa $\begin{cases} H = \\ \kappa = \end{cases}$	0·185 229	....	....	....	0·185 229

Table II.

Helbre Island.

Commence 0 h., January 1.

N.B.—Referred to G.M.T.

Year	1858.	1859.	1860.	1861.	1862.	1863.
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$						
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	3·138 2	3·177 3	3·163 2	3·171 2	3·119 3	3·120 3
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·033 322	0·033 329	0·026 298	0·030 332	0·026 317	0·025 300
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$						
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$						
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·008 289	0·043 8	0·036 108	0·023 60	0·080 125	0·013 267
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	9·768 319	9·763 320	9·929 319	9·828 318	9·740 320	9·709 320
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·104 304	0·091 288	0·106 307	0·140 278	0·079 283	0·117 279
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·446 216	0·441 219	0·491 214	0·479 210	0·409 218	0·500 213
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·065 37	0·063 51	0·081 26	0·066 21	0·065 28	0·066 36
$M_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·013 350	0·007 51	0·012 339	0·013 6	0·011 309	0·013 13
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·367 41	0·368 42	0·361 42	0·404 42	0·379 44	0·377 40
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·387 192	0·376 187	0·376 186	0·404 188	0·387 188	0·388 189
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·922 358	0·883 355	0·919 354	0·916 1	0·928 354	0·989 5
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·172 184	0·147 180	0·131 190	0·131 99	0·162 176	0·138 194
$J \begin{cases} H = \\ \kappa = \end{cases}$	0·022 251	0·018 159				

Table II.

Helbre Island.

Commence 0 h., January 1.

N.B.—Referred to G.M.T.

Year	1858.	1859.	1860.	1861.	1862.	1863.
Q $\begin{cases} H = \\ \kappa = \end{cases}$	0·108 359	0·099 334				
L $\begin{cases} H = \\ \kappa = \end{cases}$	0·370 334	0·561 354	0·477 336	0·424 324	0·215 256	0·315 353
N $\begin{cases} H = \\ \kappa = \end{cases}$	1·855 296	1·896 292	1·794 291	1·883 295	1·847 297	1·843 296
λ $\begin{cases} H = \\ \kappa = \end{cases}$	0·144 327	0·204 293	0·058 14	0·202 353	0·255 357	0·182 323
ν $\begin{cases} H = \\ \kappa = \end{cases}$	0·189 268	0·321 274	0·221 336	0·626 277	0·371 210	0·611 276
μ $\begin{cases} H = \\ \kappa = \end{cases}$	0·033 80	0·176 44	0·076 30	0·145 32	0·026 345	0·057 73
R $\begin{cases} H = \\ \kappa = \end{cases}$	....	0·022 18	....	0·102 291		
T $\begin{cases} H = \\ \kappa = \end{cases}$	....	0·222 311	....	0·406 6		
MS $\begin{cases} H = \\ \kappa = \end{cases}$	0·275 276	0·206 265	0·261 272	0·310 267	0·257 277	0·270 266
2SM $\begin{cases} H = \\ \kappa = \end{cases}$	0·132 217	0·122 230	0·123 237	0·126 208	0·126 216	0·123 234
Mm $\begin{cases} H = \\ \kappa = \end{cases}$						
Mf $\begin{cases} H = \\ \kappa = \end{cases}$						
MSf $\begin{cases} H = \\ \kappa = \end{cases}$						
Sa $\begin{cases} H = \\ \kappa = \end{cases}$						
Ssa $\begin{cases} H = \\ \kappa = \end{cases}$						

Table II.

Helbre Island.

Commence 0 h., January 1.

N.B.—Referred to G.M.T

Year	1864.	1865.	1866.	1867.	Mean.
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$					
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	3·089 3	3·093 3	3·106 1	3·108 2	3·128 3
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·035 309	0·029 303	0·030 304	0·034 302	0·030 312
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$					
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$					
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·002 166	0·034 256	0·044 336	0·046 284	0·033 262
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	9·728 321	9·762 320	9·708 319	9·645 319	9·758 319
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·104 305	0·077 285	0·107 310	0·110 293	0·104 293
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·515 213	0·510 211	0·503 209	0·494 211	0·479 213
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·078 44	0·069 42	0·079 32	0·072 28	0·070 34
$M_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·011 18	0·009 348	0·009 307	0·005 338	0·010 352
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·341 37	0·386 41	0·363 40	0·357 39	0·370 41
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·388 189	0·416 189	0·419 185	0·370 187	0·391 188
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·738 0	0·919 4	0·918 351	0·770 357	0·890 358
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·134 176	0·153 179	0·160 179	0·134 183	0·146 174
$J \begin{cases} H = \\ \kappa = \end{cases}$	....	....	0·018 342	0·044 98	0·026 122

Table II.

Helbre Island.

Commence 0 h., January 1.

N.B.—Referred to G.M.T.

Year	1864.	1865.	1866.	1867.	Mean.
Q $\begin{cases} H = \\ \kappa = \end{cases}$	....	....	0·121 339	0·122 350	0·113 345
L $\begin{cases} H = \\ \kappa = \end{cases}$	0·506 356	0·554 342	0·390 317	0·466 341	0·428 331
N $\begin{cases} H = \\ \kappa = \end{cases}$	1·923 296	1·852 295	1·824 298	1·849 297	1·857 295
λ $\begin{cases} H = \\ \kappa = \end{cases}$	0·275 334	0·263 343	0·254 343	0·106 290	0·194 334
ν $\begin{cases} H = \\ \kappa = \end{cases}$	0·666 289	0·683 295	0·522 263	0·173 291	0·438 278
μ $\begin{cases} H = \\ \kappa = \end{cases}$	0·061 11	0·095 43	0·012 331	0·151 66	0·083 34
R $\begin{cases} H = \\ \kappa = \end{cases}$	....	0·050 344	....	0·026 63	0·050 359
T $\begin{cases} H = \\ \kappa = \end{cases}$	....	0·230 356	....	0·158 277	0·254 327
MS $\begin{cases} H = \\ \kappa = \end{cases}$	0·314 266	0·322 264	0·290 261	0·292 260	0·280 267
2SM $\begin{cases} H = \\ \kappa = \end{cases}$	0·094 212	0·124 210	0·104 221	0·112 230	0·119 221
Mm $\begin{cases} H = \\ \kappa = \end{cases}$					
Mf $\begin{cases} H = \\ \kappa = \end{cases}$					
MSf $\begin{cases} H = \\ \kappa = \end{cases}$					
Sa $\begin{cases} H = \\ \kappa = \end{cases}$					
Ssa $\begin{cases} H = \\ \kappa = \end{cases}$					

Table III.

1, *Aden.* 2, *Karachi.* 3, *Okha.* 4, *Kathiwadar.* 5, *Bombay.*
6, *Karwar.* 7, *Beypore.*

		1	2	3	4	5	6	7
Years.		1879–83.	1868–83.	1874–5.	1881–2.	1878–82.	1878–83.	1878–83.
No. of years observed ...		4	15	1	1	5	5	5
S_1	$H =$	0·090	0·082	0·074	0·134	0·078	0·057	0·061
	$\kappa =$	162	158	150	201	182	159	174
S_2	$H =$	0·697	0·948	1·222	1·207	1·622	0·624	0·330
	$\kappa =$	248	322	14	81	3	335	18
S_4	$H =$	0·006	0·010	0·013	0·029	0·012	0·010	0·005
	$\kappa =$	271	14	117	273	256	100	137
S_6	$H =$	0·004	0·007	0·003	0·013	0·003	0·005	0·005
	$\kappa =$	201	295	21	42	171	52	247
S_8	$H =$	0·001	0·001	0·001	0·002	0·001	0·002	0·001
	$\kappa =$	259	204	220	264	115	304	339
M_1	$H =$	0·047	0·044	0·051	0·057	0·051	0·033	0·029
	$\kappa =$	21	30	43	35	49	41	73
M_2	$H =$	1·568	2·504	3·820	2·970	4·034	1·742	0·931
	$\kappa =$	229	294	347	55	330	302	329
M_3	$H =$	0·018	0·039	0·030	0·020	0·065	0·014	0·010
	$\kappa =$	209	330	21	152	23	273	197
M_4	$H =$	0·007	0·024	0·136	0·220	0·124	0·055	0·020
	$\kappa =$	314	14	107	178	322	17	41
M_6	$H =$	0·005	0·049	0·007	0·139	0·011	0·011	0·007
	$\kappa =$	341	210	270	137	111	284	138
M_8	$H =$	0·003	0·005	0·011	0·002	0·004	0·002	0·008
	$\kappa =$	43	267	96	199	351	109	146
O	$H =$	0·653	0·647	0·693	0·720	0·650	0·497	0·340
	$\kappa =$	38	47	57	66	48	49	57
K_1	$H =$	1·299	1·281	1·414	1·611	1·393	1·004	0·704
	$\kappa =$	36	46	53	66	45	45	52
K_2	$H =$	0·201	0·278	0·328	0·324	0·410	0·174	0·080
	$\kappa =$	244	320	17	79	352	330	11
P	$H =$	0·388	0·380	0·384	0·436	0·402	0·277	0·191
	$\kappa =$	33	46	50	71	42	42	53
J	$H =$	0·103	0·079	0·107	0·175	0·089	0·068	0·044
	$\kappa =$	52	70	81	107	72	57	63

Table III.

1, *Aden.*   2, *Karachi.*   3, *Okha.*   4, *Kathiwadar.*   5, *Bombay.*
6, *Karwar.*   7, *Beypore.*

	1	2	3	4	5	6	7
Years.	1879–83.	1868–83.	1874–5.	1881–2.	1878–82.	1878–83.	1878–83.
No. of years observed ...	4	15	1	1	5	5	5
$Q \begin{cases} H = \\ \kappa = \end{cases}$	0·151 42	0·129 52	0·137 59	0·152 68	0·131 52	0·114 59	0·081 66
$L \begin{cases} H = \\ \kappa = \end{cases}$	0·046 230	0·081 299	0·221 23	0·079 261	0·108 316	0·056 317	0·027 348
$N \begin{cases} H = \\ \kappa = \end{cases}$	0·427 225	0·600 277	0·781 322	0·755 34	1·003 314	0·410 282	0·197 305
$\lambda \begin{cases} H = \\ \kappa = \end{cases}$	0·026 197	0·042 282	0·073 23	0·043 107	0·032 235	0·020 273	0·011 313
$\nu \begin{cases} H = \\ \kappa = \end{cases}$	0·099 226	0·142 277	0·164 8	0·131 15	0·199 315	0·088 294	0·055 311
$\mu \begin{cases} H = \\ \kappa = \end{cases}$	0·075 196	0·061 263	0·203 182	0·286 343	0·206 308	0·044 263	0·019 258
$R \begin{cases} H = \\ \kappa = \end{cases}$	0·005 30	0·030 276	....	....	0·042 283	0·008 145	0·023 132
$T \begin{cases} H = \\ \kappa = \end{cases}$	0·050 240	0·068 332	....	....	0·171 24	0·061 155	0·040 19
$MS \begin{cases} H = \\ \kappa = \end{cases}$	0·012 159	0·027 307	0·064 111	0·159 215	0·129 24	0·026 67	0·009 77
$2SM \begin{cases} H = \\ \kappa = \end{cases}$	0·023 109	0·021 123	0·044 292	0·029 154	0·036 106	0·007 315	0·005 296
$Mm \begin{cases} H = \\ \kappa = \end{cases}$	0·042 354	0·060 95	0·066 311	0·052 8	0·056 26	0·065 27	0·091 32
$Mf \begin{cases} H = \\ \kappa = \end{cases}$	0·045 31	0·033 316	0·050 44	0·027 103	0·051 346	0·042 5	0·071 23
$MSf \begin{cases} H = \\ \kappa = \end{cases}$	0·014 341	0·036 266	0·141 250	0·040 153	0·031 228	0·022 164	0·038 216
$Sa \begin{cases} H = \\ \kappa = \end{cases}$	0·390 357	0·138 79	0·162 3	0·236 133	0·186 358	0·352 310	0·309 313
$Ssa \begin{cases} H = \\ \kappa = \end{cases}$	0·095 126	0·135 142	0·121 145	0·109 156	0·122 228	0·068 228	0·177 205

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Table III.

8, *Paumben*.   9, *Negapatam*.   10. *Madras*.   11. *Vizagapatam*.
12. *False Point*.   13. *Dublat*.   14. *Diamond Harbour*.

	8	9	10	11	12	13	14
Years.	1878–82.	1881–3.	1880–3.	1879–83.	1881–3.	1881–3.	1881–3.
No. of years observed ...	4	2	3	4	2	2	2
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·036 148	0·046 108	0·025 92	0·052 68	0·015 6	0·047 110	0·085 152
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·372 92	0·274 284	0·441 276	0·656 285	1·018 303	2·108 327	2·252 26
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·003 261	0·005 151	0·002 161	0·005 47	0·008 329	0·018 211	0·120 326
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·004 197	0·000 150	0·001 112	0·001 170	0·003 169	0·004 99	0·013 251
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·003 224	0·001 227	0·001 162	0·002 79	0·003 240	0·006 113	0·003 353
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·011 35	0·005 111	0·008 7	0·012 295	0·009 30	0·008 41	0·020 95
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·585 47	0·720 252	1·049 248	1·473 253	2·250 270	4·610 290	5·177 344
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·016 170	0·003 103	0·004 62	0·006 329	0·014 30	0·046 133	0·035 223
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·016 194	0·021 77	0·003 146	0·015 331	0·038 230	0·095 144	0·745 246
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·011 42	0·012 128	0·010 154	0·005 72	0·010 63	0·014 255	0·152 106
$M_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·005 314	0·005 303	0·002 46	0·003 209	0·003 246	0·012 294	0·062 345
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·115 45	0·091 322	0·097 325	0·141 331	0·177 335	0·189 334	0·234 345
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·294 46	0·225 345	0·293 340	0·359 342	0·408 345	0·493 352	0·496 14
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·113 90	0·077 286	0·112 280	0·203 277	0·255 297	0·596 318	0·656 23
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·110 46	0·084 346	0·097 344	0·096 339	0·145 344	0·155 343	0·175 9
$J \begin{cases} H = \\ \kappa = \end{cases}$	0·014 48	0·011 328	0·021 318	0·025 337	0·026 312	0·024 324	0·031 320

Table III.

8, *Paumben.* 9, *Negapatam.* 10, *Madras.* 11, *Vizagapatam.*
12, *False Point.* 13, *Dublat.* 14, *Diamond Harbour.*

		8	9	10	11	12	13	14
Years.		1878–82.	1881–3.	1880–3.	1879–83.	1881–3.	1881–3.	1881–3.
No. of years observed ...		4	2	3	4	2	2	2
Q	$H =$	0·021	0·007	0·005	0·009	0·011	0·009	0·030
	$\kappa =$	89	181	111	325	324	333	9
L	$H =$	0·023	0·027	0·036	0·052	0·059	0·167	0·261
	$\kappa =$	58	279	307	254	254	291	351
N	$H =$	0·082	0·158	0·240	0·314	0·476	0·947	0·951
	$\kappa =$	31	244	242	246	267	286	339
λ	$H =$	0·016	0·015	0·029	0·022	0·063	0·219	0·115
	$\kappa =$	64	231	299	264	180	316	337
ν	$H =$	0·027	0·048	0·044	0·075	0·142	0·232	0·303
	$\kappa =$	30	217	271	199	244	251	289
μ	$H =$	0·009	0·021	0·041	0·027	0·075	0·165	0·303
	$\kappa =$	105	122	178	259	273	15	85
R	$H =$	0·016	0·031	0·016	0·027	0·034	0·219	0·216
	$\kappa =$	114	349	103	188	217	289	10
T	$H =$	0·025	0·050	0·056	0·051	0·017	0·137	0·078
	$\kappa =$	92	255	257	263	149	299	55
MS	$H =$	0·018	0·018	0·003	0·012	0·041	0·077	0·695
	$\kappa =$	292	96	170	5	274	155	285
2SM	$H =$	0·010	0·007	0·022	0·012	0·017	0·072	0·074
	$\kappa =$	333	188	209	225	187	211	271
Mn	$H =$	0·048	0·057	0·047	0·055	0·063	0·040	0·102
	$\kappa =$	27	328	80	54	55	77	1
Mf	$H =$	0·043	0·039	0·045	0·042	0·067	0·048	0·150
	$\kappa =$	355	7	6	2	35	66	39
MSf	$H =$	0·016	0·091	0·019	0·046	0·050	0·063	0·451
	$\kappa =$	141	7	58	23	356	356	33
Sa	$H =$	0·149	0·533	0·385	0·714	0·793	0·900	1·100
	$\kappa =$	302	232	212	182	166	150	143
Ssa	$H =$	0·157	0·358	0·305	0·332	0·287	0·208	0·066
	$\kappa =$	108	130	128	114	146	136	71

Table III.

15, *Kidderpore.*   16, *Elephant Point.*   17, *Rangoon.*   18, *Amherst.*
19, *Moulmein.*   20, *Port Blair.*   21, *Fort Point.*

	15	16	17	18	19	20	21
Years.	1881–3.	1880–1.	1880–3.	1880–3.	1880–3.	1880–3.	1858–61.
No. of years observed ...	2	1	3	3	3	3	3
S_1 $H =$	0·091	0·113	0·113	0·222	0·096	0·021	0·015
$\kappa =$	193	79	133	141	149	38	212
S_2 $H =$	1·468	2·337	2·012	2·769	1·362	0·968	0·390
$\kappa =$	101	143	170	105	148	315	336
S_4 $H =$	0·075	0·037	0·081	0·106	0·067	0·003	
$\kappa =$	119	162	259	122	229	84	
S_6 $H =$	0·005	0·021	0·010	0·012	0·005	0·002	
$\kappa =$	299	94	48	187	183	131	
S_8 $H =$	0·008	0·008	0·005	0·008	0·002	0·002	
$\kappa =$	311	60	120	276	211	80	
M_1 $H =$	0·013	0·019	0·033	0·032	0·018	0·010	0·038
$\kappa =$	157	88	183	255	138	291	170
M_2 $H =$	3·627	5·870	5·545	6·233	3·779	2·022	1·689
$\kappa =$	58	103	131	69	113	278	332
M_3 $H =$	0·015	0·025	0·021	0·019	0·025	0·007	
$\kappa =$	331	146	178	261	209	16	
M_4 $H =$	0·727	0·079	0·410	0·350	0·901	0·008	0·071
$\kappa =$	37	46	169	51	171	151	24
M_6 $H =$	0·159	0·205	0·233	0·118	0·102	0·002	
$\kappa =$	319	349	87	252	200	317	
M_8 $H =$	0·078	0·031	0·081	0·014	0·038	0·002	
$\kappa =$	270	322	97	249	133	70	
O $H =$	0·220	0·349	0·294	0·317	0·253	0·160	0·780
$\kappa =$	21	356	28	339	48	302	87
K_1 $H =$	0·389	0·807	0·670	0·699	0·438	0·397	1·219
$\kappa =$	56	18	35	5	40	327	107
K_2 $H =$	0·435	0·401	0·570	1·104	0·336	0·282	0·135
$\kappa =$	96	91	169	90	155	311	330
P $H =$	0·144	0·199	0·149	0·177	0·134	0·134	0·373
$\kappa =$	47	33	55	337	60	326	105
J $H =$	0·014	0·110	0·030	0·074	0·022	0·027	0·053
$\kappa =$	327	61	33	34	107	325	121

Table III.

15, *Kidderpore.* 16, *Elephant Point.* 17, *Rangoon.* 18, *Amherst.*
19, *Moulmein.* 20, *Port Blair,* 21, *Fort Point.*

		15	16	17	18	19	20	21
Years.		1881–3.	1880–1.	1880–3.	1880–3.	1880–3.	1880–3.	1858–61.
No. of years observed ...		2	1	3	3	3	3	3
Q	$H =$	0·039	0·042	0·027	0·054	0·045	0·024	0·121
	$\kappa =$	9	336	31	322	53	237	74
L	$H =$	0·187	0·346	0·407	0·292	0·279	0·068	0·059
	$\kappa =$	74	109	157	112	139	272	338
N	$H =$	0·638	1·543	0·990	1·322	0·679	0·399	0·374
	$\kappa =$	47	80	117	54	102	274	305
λ	$H =$	0·101	0·659	0·257	0·300	0·176	0·043	0·026
	$\kappa =$	107	145	170	119	165	280	345
ν	$H =$	0·238	0·681	0·317	0·425	0·233	0·121	0·064
	$\kappa =$	353	209	100	177	84	254	305
μ	$H =$	0·242	0·356	0·514	0·303	0·313	0·086	0·029
	$\kappa =$	182	279	290	301	270	292	227
R	$H =$	0·167	......	0·117	0·451	0·097	0·020	0·008
	$\kappa =$	77	......	66	252	70	326	63
T	$H =$	0·147	......	0·290	0·841	0·200	0·099	0·014
	$\kappa =$	107	......	128	144	110	313	198
MS	$H =$	0·645	0·135	0·386	0·347	0·712	0·009	0·031
	$\kappa =$	81	67	210	82	211	215	21
2SM	$H =$	0·085	0·042	0·160	0·151	0·124	0·023	
	$\kappa =$	2	84	54	10	38	154	
Mm	$H =$	0·244	0·145	0·236	0·095	0·360	0·014	
	$\kappa =$	351	6	23	48	14	20	
Mf	$H =$	0·297	0·098	0·208	0·097	0·334	0·057	
	$\kappa =$	38	310	34	350	41	9	
MSf	$H =$	0·875	0·059	0·554	0·055	1·110	0·015	
	$\kappa =$	39	273	49	71	46	61	
Sa	$H =$	2·740	0·930	1·486	0·726	2·434	0·204	
	$\kappa =$	157	146	150	140	149	150	
Ssa	$H =$	0·822	0·261	0·126	0·156	0·603	0·117	
	$\kappa =$	269	198	328	235	287	177	

Table III.

22, *San Diego.* 23, *Port Leopold.* 24, *Beechey Island.* 25, *Cat Island, Gulf of Mexico.* 26, *Toulon.* 27, *Brest.* 28, *Ramsgate (referred to G.M.T.).*

	22	23	24	25	26	27	28
Years.	1860–1.	1848–9.	1858–9.	1848.	1853.	1875.	1864.
No. of years observed ...	2	1	1	1	1	1	1
S_1 H =	0·028	0·031	......	0·044	0·010	0·015	0·037
S_1 κ =	238	27	......	10	186	52	313
S_2 H =	0·695	0·643	0·686	0·068	0·090	2·551	1·877
S_2 κ =	274	29	34	24	250	138	33
S_4 H =	0·006	0·007	......	......	0·002	......	0·032
S_4 κ =	204	257	......	......	298	......	4
S_6 H =	......	......	......	......	......	......	0·027
S_6 κ =	......	......	......	......	......	......	27
S_8 H =							
S_8 κ =							
M_1 H =	0·049	0·045	......	0·007	0·010	0·004	
M_1 κ =	106	230	......	26	319	167	
M_2 H =	1·715	2·001	1·996	0·116	0·190	6·766	6·144
M_2 κ =	276	338	347	11	252	100	341
M_3 H =	0·007	......	......	......	0·004	0·067	0·043
M_3 κ =	19	......	......	......	9	2	56
M_4 H =	0·028	0·015	0·024	......	0·011	0·169	0·548
M_4 κ =	203	202	268	......	349	85	243
M_6 H =	0·012	......	......	......	0·002	0·106	0·164
M_6 κ =	84	......	......	......	152	325	127
M_8 H =	......	......	......	......	0·001	0·008	0·054
M_8 κ =	......	......	......	......	146	203	54
O H =	0·696	0·443	0·488	0·479	0·059	0·211	0·342
O κ =	78	164	162	315	302	322	180
K_1 H =	1·096	0·899	0·901	0·525	0·116	0·208	0·223
K_1 κ =	94	216	243	325	3	66	18
K_2 H =	0·207	0·175	0·151	0·028	0·024	0·553	0·520
K_2 κ =	263	29	54	288	254	144	24
P H =	0·357	0·216	0·215	0·156	0·041	0·071	0·073
P κ =	90	218	222	321	0	59	353
J H =	0·084	......	......	0·035	0·008	.	
J κ =	99	......	......	297	15		

Table III.

22, *San Diego.* 23, *Port Leopold.* 24, *Beechey Island.* 25, *Cat Island, Gulf of Mexico.* 26, *Toulon.* 27, *Brest.* 28, *Ramsgate (referred to G.M.T.).*

	22	23	24	25	26	27	28
Years.	1860–1.	1848–9.	1858–9.	1848.	1853.	1875.	1864.
No. of years observed ...	2	1	1	1	1	1	1
Q $\{$ H = $\{$ κ =	0·145 75	....	....	0·091 307	0·006 242		
L $\{$ H = $\{$ κ =	0·019 344	0·044 3	0·080 47	0·012 33	0·007 224	0·192 101	0·447 16
N $\{$ H = $\{$ κ =	0·428 260	0·420 306	0·429 315	0·026 33	0·046 240	1·375 83	1·084 312
λ $\{$ H = $\{$ κ =	0·059 224	....	....	....	0·003 10	0·059 59	0·174 351
ν $\{$ H = $\{$ κ =	0·102 247	....	....	....	0·008 219	0·293 45	0·344 330
μ $\{$ H = $\{$ κ =	0·027 240	....	....	....	0·007 219	0·307 92	0·251 87
R $\{$ H = $\{$ κ =	0·010 153						
T $\{$ H = $\{$ κ =	0·041 319						
MS $\{$ H = $\{$ κ =	0·009 189	....	....	....	....	....	0·324 127
2SM $\{$ H = $\{$ κ =	....	....	....	....	....	....	0·141 262
Mm $\{$ H = $\{$ κ =	....	....	....	0·094 304	0·061 228	0·038 328	0·029 45
Mf $\{$ H = $\{$ κ =	....	....	....	0·069 134	0·045 118	0·069 76	0·044 288
MSf $\{$ H = $\{$ κ =	....	....	....	0·095 336	0·018 53	0·290 52	0·094 206
Sa $\{$ H = $\{$ κ =	....	....	....	0·274 145	0·157 279	0·261 234	0·127 181
Ssa $\{$ H = $\{$ κ =	....	....	....	0·128 35	0·090 144	0·071 93	0·075 288

Table III.

29, *West Hartlepool.*   30, *Portland Breakwater.*   31, *Liverpool.*
32, *Liverpool.*   33, *Helbre Island.*   34, *Freemantle, West Australia.*
35, *Mauritius, Port Louis.*

N.B.—English ports referred to G.M.T.

		29	30	31	32	33	34	35
Years.		1858–61.	1851, 57, 66, & 70.	1857–60.	1866–70.	1858–67.	1873–4.	1838–9.
No. of years observed ...		3	4	3	4	10	1	1
S_1	H =	0·033	0·037	0·066	0·038	......	0·039	0·013
	κ =	152	89	62	83	......	·60	32
S_2	H =	1·738	1·074	3·240	3·101	3·128	0·145	0·331
	κ =	139	244	11	12	3	292	26
S_4	H =	0·022	0·012	0·056	0·058	0·030	0·004	0·003
	κ =	179	186	316	313	312	72	116
S_6	H =	......	......	......	......	......	......	0·002
	κ =	......	......	......	......	......	......	235
S_8	H =	......	......	......	......	......	......	0·001
	κ =	......	......	......	......	......	......	114
M_1	H =	0·026	0·015	0·020	0·039	0·033	0·025	0·004
	κ =	104	292	258	336	262	261	100
M_2	H =	5·163	2·048	10·100	9·881	9·758	0·159	0·433
	κ =	98	194	326	327	319	286	23
M_3	H =	0·036	0·036	0·124	0·097	0·104	0·008	0·016
	κ =	118	180	324	324	293	217	167
M_4	H =	0·095	0·468	0·702	0·683	0·479	0·010	0·004
	κ =	109	32	222	223	213	260	296
M_6	H =	0·074	0·207	0·211	0·184	0·070	0·007	0·005
	κ =	50	70	348	350	34	277	94
M_8	H =	......	0·012	0·077	0·061	0·010	0·005	0·001
	κ =	......	49	271	285	352	259	168
O	H =	0·434	0·163	0·377	0·366	0·370	0·372	0·140
	κ =	85	353	43	40	41	291	98
K_1	H =	0·380	0·295	0·358	0·353	0·391	0·638	0·244
	κ =	248	114	194	195	188	300	121
K_2	H =	0·488	0·301	0·939	0·934	0·890	0·057	0·138
	κ =	135	237	7	7	358	288	23
P	H =	0·112	0·108	0·130	0·126	0·146	0·156	0·056
	κ =	232	108	192	180	174	297	132
J	H =	0·028	......	......	......	0·026	0·029	0·009
	κ =	224	......	......	......	122	310	118

Table III.

29, *West Hartlepool.* 30, *Portland Breakwater.* 31, *Liverpool.*
32, *Liverpool.* 33, *Helbre Island.* 34, *Freemantle, West Australia.*
35, *Mauritius, Port Louis.*

N.B.—English ports referred to G.M.T.

	29	30	31	32	33	34	35
Years.	1858–61.	1851, 57, 66, & 70.	1857–60.	1866–70.	1858–67.	1873–4.	1838–9.
No. of years observed ...	3	4	3	4	10	1	1
Q $\{$ H =	0·148	......	......	......	0·113	0·099	0·024
$\phantom{Q\{}$ κ =	32	......	......	......	345	290	78
L $\{$ H =	0·200	0·171	0·540	0·521	0·428	0·021	0·033
$\phantom{L\{}$ κ =	114	111	345	328	331	244	4
N $\{$ H =	0·988	0·477	1·923	1·888	1·857	0·041	0·137
$\phantom{N\{}$ κ =	73	185	306	305	295	340	32
λ $\{$ H =	0·095	0·083	0·259	0·204	0·194	0·006	0·018
$\phantom{\lambda\{}$ κ =	116	117	337	336	334	356	298
ν $\{$ H =	0·270	0·115	0·570	0·498	0·438	0·012	0·008
$\phantom{\nu\{}$ κ =	88	140	285	297	278	232	257
μ $\{$ H =	0·085	0·374	0·291	0·228	0·083	0·016	0·019
$\phantom{\mu\{}$ κ =	6	196	38	41	34	324	317
R $\{$ H =	0·008	......	0·092	......	0·050		
$\phantom{R\{}$ κ =	158	......	46	......	359		
T $\{$ H =	0·140	......	0·235	......	0·254		
$\phantom{T\{}$ κ =	200	......	333	......	327		
MS $\{$ H =	0·044	0·267	0·404	0·407	0·280		
$\phantom{MS\{}$ κ =	126	90	270	270	267		
2SM $\{$ H =	0·026	0·059	0·152	0·125	0·119		
$\phantom{2SM\{}$ κ =	310	353	216	227	221		
Mm $\{$ H =	0·127	......	0·147	0·064	......	0·079	0·047
$\phantom{Mm\{}$ κ =	93	......	165	260	......	147	297
Mf $\{$ H =	0·046	......	0·036	0·057	......	0·082	0·036
$\phantom{Mf\{}$ κ =	205	......	141	344	......	25	350
MSf $\{$ H =	0·137	......	0·058	0·051	......	0·032	0·015
$\phantom{MSf\{}$ κ =	59	......	246	68	......	178	91
Sa $\{$ H =	0·265	......	0·332	0·452	......	0·537	0·211
$\phantom{Sa\{}$ κ =	219	......	227	272	......	27	346
Ssa $\{$ H =	0·097	......	0·128	0·185	......	0·175	0·118
$\phantom{Ssa\{}$ κ =	223	......	175	229	......	126	118

Table III.

36, Falkland Islands, Port Louis.   37, Malta.   38, Marseilles.
39, Toulon.

	36	37	38	39
Years.	1842–3.	1871–2.	1850–1.	Mean of 1847, 48, 53.
No. of years observed ...	1	1	1	
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·289 25	0·009 162	0·019 48	0·011 20
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·492 195	0·120 100	0·078 247	0·091 250
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·007 64	0·001 37	0·003 277	0·002 288
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$				
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$				
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·024 79	0·005 69	0·003 124	0·005 168
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	1·544 157	0·197 93	0·220 228	0·195 246
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·018 83	0·002 204	0·005 185	0·004 174
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·068 357	0·003 350	0·019 0	0·014 352
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·012 76	0·001 26	....	0·001 145
$M_8 \begin{cases} H = \\ \kappa = \end{cases}$	0·010 193	0·003 127	....	0·002 60
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·451 4	0·024 83	0·069 106	0·060 120
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·358 37	0·035 43	0·104 181	0·105 186
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·170 206	0·033 110	0·016 254	0·019 254
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·141 87	0·011 58	0·040 182	0·041 178
$J \begin{cases} H = \\ \kappa = \end{cases}$	....	0·001 59	0·008 198	0·005 176

Table III.

36, *Falkland Islands, Port Louis.*   37, *Malta.*   38, *Marseilles.*
39, *Toulon.*

	36	37	38	39
Years.	1842–3.	1871–2.	1850–1.	Mean of 1847, 48, 53.
No. of years observed ...	1	1	3	
$Q \begin{cases} H = \\ \kappa = \end{cases}$	....	0·006 69	0·012 28	0·010 44
$L \begin{cases} H = \\ \kappa = \end{cases}$	0·095 135	0·016 110	0·006 280	0·009 255
$N \begin{cases} H = \\ \kappa = \end{cases}$	0·335 130	0·031 114	0·043 221	0·049 226
$\lambda \begin{cases} H = \\ \kappa = \end{cases}$	....	0·007 72	0·004 190	0·010 308
$\nu \begin{cases} H = \\ \kappa = \end{cases}$	....	0·003 198	0·003 308	0·011 158
$\mu \begin{cases} H = \\ \kappa = \end{cases}$	....	0·003 73	0·004 187	0·009 193
$R \begin{cases} H = \\ \kappa = \end{cases}$				
$T \begin{cases} H = \\ \kappa = \end{cases}$				
$MS \begin{cases} H = \\ \kappa = \end{cases}$				
$2SM \begin{cases} H = \\ \kappa = \end{cases}$				
$Mm \begin{cases} H = \\ \kappa = \end{cases}$	....	....	0·010 293	0·057 196
$Mf \begin{cases} H = \\ \kappa = \end{cases}$	....	....	0·019 229	0·061 159
$MSf \begin{cases} H = \\ \kappa = \end{cases}$	....	....	0·008 41	0·029 323
$Sa \begin{cases} H = \\ \kappa = \end{cases}$	....	....	0·151 185	0·123 254
$Ssa \begin{cases} H = \\ \kappa = \end{cases}$	....	....	0·170 118	0·108 114

Table IV.

Penobscot Bay.

Year	1870.	1871.	1872.	1873.	1874.	1875.	Mean.
S_1 $\begin{cases} H = \\ \kappa = \end{cases}$	0·068 129	0·015 78	0·022 67	0·020 123	0·020 73	0·002 25	0·024± 0·004 65·9 ±10·8
S_2 $\begin{cases} K = \\ \kappa = \end{cases}$	0·825 350	0·735 356	0·776 357	0·797 354	0·746 354	0·747 358	0·771± 0·007 354·7 ± 9·8
S_4 $\begin{cases} H = \\ \kappa = \end{cases}$	0·008 113	0·004 73	0·003 346	0·006 222	0·005 350	0·004 29	
S_6 $\begin{cases} H = \\ \kappa = \end{cases}$							
S_8 $\begin{cases} H = \\ \kappa = \end{cases}$							
M_1 $\begin{cases} H = \\ \kappa = \end{cases}$		Not reduced according to same rules as the rest of our results and omitted.					
M_2 $\begin{cases} H = \\ \kappa = \end{cases}$	4·878 320	4·849 319	4·910 320	4·911 320	4·884 320	4·937 320	4·895± 0·008 319·82 ± 0·10
M_3 $\begin{cases} H = \\ \kappa = \end{cases}$	0·012 263	0·002 135	0·009 161	0·012 123	0·006 279	0·002 229	
M_4 $\begin{cases} H = \\ \kappa = \end{cases}$	0·039 160	0·021 154	0·019 173	0·028 115	0·020 127	0·022 121	
M_6 $\begin{cases} H = \\ \kappa = \end{cases}$	0·118 61	0·115 60	0·121 65	0·125 61	0·122 60	0·119 58	
M_8 $\begin{cases} H = \\ \kappa = \end{cases}$	0·017 336	0·014 314	0·009 354	0·018 336	0·014 326	0·016 320	
O $\begin{cases} H = \\ \kappa = \end{cases}$	0·363 113	0·351 109	0·364 114	0·353 109	0·354 112	0·366 110	0·359± 0·002 111·1 ± 0·55
K_1 $\begin{cases} H = \\ \kappa = \end{cases}$	0·455 129	0·459 130	0·452 132	0·452 129	0·459 129	0·440 129	0·453± 0·002 129·6 ± 0·35
K_2 $\begin{cases} H = \\ \kappa = \end{cases}$	0·256 5	0·229 351	0·226 359	0·195 2	0·235 4	0·238 352	0·230± 0·006 358·8 ± 1·7
P $\begin{cases} H = \\ \kappa = \end{cases}$	0·152 127	0·151 133	0·148 137	0·152 132	0·155 124	0·160 131	0·153± 0·001 130·5 ± 1·2
J $\begin{cases} H = \\ \kappa = \end{cases}$	0·025 341	0·014 266	0·026 320	0·031 315	0·019 323	0·009 292	0·020 315

Table IV.

Penobscot Bay.

Year	1870.	1871.	1872.	1873.	1874.	1875.	Mean.
Q $\{$ H =	0·060	0·058	0·073	0·058	0·077	0·073	0·066± 0·002
$\quad$ κ =	245	271	259	246	272	284	262·8 ± 3·7
L $\{$ H =	0·336	0·172	0·195	0·285	0·223	0·209	0·237± 0·017
$\quad$ κ =	190	187	156	193	219	209	192·1 ± 6·4
N $\{$ H =	1·046	1·136	0·986	0·929	0·991	1·027	1·019± 0·019
$\quad$ κ =	295	291	287	289	291	289	290·3 ± 0·8
λ $\{$ H =	0·083	0·132	0·043	0·120	0·156	0·177	0·064
$\quad$ κ =	162	256	146	256	125	234	196
ν $\{$ H =	0·162	0·335	0·093	0·320	0·215	0·289	0·274
$\quad$ κ =	301	317	306	317	263	323	308
μ $\{$ H =	0·043	0·034	0·015	0·031	0·048	0·035	0·032
$\quad$ κ =	237	194	176	241	219	202	216
R $\{$ H =	0·068	0·026	0·055	0·050	0·035	0·062	
$\quad$ κ =	227	26	92	352	182	8	
T $\{$ H =	0·189	0·104	0·190	0·233	0·156	0·087	0·022
$\quad$ κ =	239	139	50	331	243	123	288
MS $\{$ H =	0·036	0·016	0·025	0·010	0·028	0·010	
$\quad$ κ =	308	210	21	299	311	75	
2SM $\{$ H =	0·039	0·014	0·021	0·025	0·055	0·025	
$\quad$ κ =	297	135	318	270	327	41	
Mm $\{$ H =	0·082	0·069	0·024	0·074	0·057	0·014	
$\quad$ κ =	96	35	34	296	279	110	
Mf $\{$ H =	0·012	0·037	0·048	0·047	0·073	0·040	
$\quad$ κ =	1	208	11	212	4	95	
MSf $\{$ H =	0·190	0·157	0·163	0·229	0·180	0·123	0·174± 0·010
$\quad$ κ =	161	151	152	161	159	159	157± 1·2
Sa $\{$ H =	0·080	0·176	....	0·120	0·177	0·262	κ is computed
$\quad$ κ =	120	162	....	167	188	226	on hypothesis
Ssa $\{$ H =	0·090	0·093	....	0·097	0·026	0·152	that these are astronomical
$\quad$ κ =	48	57	....	111	146	74	tides.

Major A. W. Baird and Prof. G. H. Darwin.

Table IV.

Port Townsend.   *Astoria, Oregon.*

Commence, January, 1874.

Year	1874.	1875.	1876.	Mean.	1874.	1875.	1876.	Mean.
S_1 $\{$ H =	0·086	0·072	0·102	0·087	0·051	0·053	......	0·052
$\quad$ κ =	113	121	114	116·2	112	117	......	115
S_2 $\{$ H =	0·557	0·558	0·542	0·552	0·778	0·774	0·811	0·788
$\quad$ κ =	130	129	129	129·5	39	38	41	40
S_4 $\{$ H =	0·007	0·011	0·013	0·010	0·012	0·009	0·007	0·009
$\quad$ κ =	349	316	316	327	344	341	348	344
S_6 $\{$ H =								
$\quad$ κ =								
S_8 $\{$ H =								
$\quad$ κ =								
M_1 $\{$ H =								
$\quad$ κ =								
M_2 $\{$ H =	2·202	2·311	2·218	2·244	2·963	2·942	2·905	2·937
$\quad$ κ =	109	108	108	108·5	12	12	11	11·7
M_3 $\{$ H =	0·021	0·015	0·022	0·019	0·021	0·013	0·029	0·021
$\quad$ κ =	41	343	298	347	107	63	34	68
M_4 $\{$ H =	0·128	0·113	0·125	0·122	0·093	0·095	0·116	0·101
$\quad$ κ =	297	299	295	297	321	329	329	326
M_6 $\{$ H =	0·032	0·027	0·028	0·029	0·033	0·026	0·033	0·031
$\quad$ κ =	240	255	236	244	121	115	111	116
M_8 $\{$ H =								
$\quad$ κ =								
O $\{$ H =	1·407	1·397	1·430	1·411	0·773	0·752	......	0·762
$\quad$ κ =	132	131	130	131	119	118	......	118
K_1 $\{$ H =	2·475	2·470	2·465	2·470	1·290	1·288	......	1·289
$\quad$ κ =	149	148	148	149	129	129	......	129
K_2 $\{$ H =	0·171	0·145	0·167	0·161	0·233	0·214	......	0·224
$\quad$ κ =	128	132	137	132	24	27	......	26
P $\{$ H =	0·776	0·751	0·787	0·771	0·374	0·347	......	0·360
$\quad$ κ =	145	147	147	147	96	96	......	96
J $\{$ H =	0·162	0·050	0·149		0·067	0·009		
$\quad$ κ =	36	345	167		172	142		

Table IV.

Port Townsend.   *Astoria, Oregon.*

Commence, January, 1874.

Year	1874.	1875.	1876.	Mean.	1874.	1875.	1876.	Mean.
Q $\{$ H =	0·297	0·315	0·295	0·302	0·175	0·156	......	0·166
$\{$ κ =	119	124	124	122	109	120	......	115
L $\{$ H =	0·085	0·107	0·080	0·091	0·117	0·119	0·109	0·112
$\{$ κ =	347	355	320	341	198	215	198	204
N $\{$ H =	0·461	0·466	0·440	0·456	0·574	0·556	0·543	0·559
$\{$ κ =	82	81	79	80	352	351	345	349
λ $\{$ H =	0·045	0·031	0·019	0·031	0·073	0·032	0·035	0·047
$\{$ κ =	6	29	332	2	192	200	150	181
ν $\{$ H =	0·156	0·089	0·029	0·091	0·202	0·127	0·129	0·153
$\{$ κ =	76	46	137	86	342	12	53	16
μ $\{$ H =	0·078	0·098	0·059	0·078	0·016	0·030	0·040	0·029
$\{$ κ =	352	7	356	358	130	142	108	127
R $\{$ H =	0·010	0·008	0·020	0·013	0·016	0·002	0·126	
$\{$ κ =	352	214	241	269	259	320	148	
T $\{$ H =	0·071	0·050	0·108		0·083	0·067	0·058	
$\{$ κ =	38	239	175		307	137	169	
MS $\{$ H =	0·062	0·072	0·058	0·064	0·055	0·049	0·053	0·052
$\{$ κ =	319	310	318	316	341	344	4	350
2SM $\{$ H =	0·011	0·017	0·018	0·016	0·018	0·021	0·030	0·023
$\{$ κ =	62	42	41	49	220	259	246	242
Mm $\{$ H =								
$\{$ κ =								
Mf $\{$ H =								
$\{$ κ =								
MSf $\{$ H =								
$\{$ κ =								
Sa $\{$ H =								
$\{$ κ =								
Ssa $\{$ H =								
$\{$ κ =								

Table IV.

San Diego.   *St. Thomas.*

Commence 0 h., January 1, 1869.   Commence October 4, 1872.

Year	1869.	1870.	1871.	Mean.	1872–3.	1873–4.	1874–5.	Mean.
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·024 54	0·024 51	0·023 12	0·024 39	0·007 233	0·017 249	0·008 251	0·011 244
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·701 274	0·697 274	0·716 275	0·704 275	0·030 245	0·032 243	0·031 242	0·031 243
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·006 221	0·005 169	0·006 204	0·006 207				
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$								
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$								
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$								
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	1·710 279	1·703 279	1·697 280	1·703 279	0·131 208	0·121 208	0·119 207	0·124 208
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·008 32	0·012 67	0·005 48	0·008 49				
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·025 200	0·026 193	0·030 194	0·027 196				
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·010 150	0·011 118	0·009 110	0·010 126				
$M_8 \begin{cases} H = \\ \kappa = \end{cases}$								
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·697 71	0·698 71	0·714 72	0·703 71	0·237 149	0·240 153	0·253 156	0·243 153
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	1·010 96	1·010 96	1·010 96	1·010 96	0·290 173	0·296 170	0·300 170	0·295 171
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·207 268	0·202 265	0·194 266	0·201 266				
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·358 93	0·349 92	0·339 95	0·349 93	0·082 190	0·080 167	0·073 170	0·078 176
$J \begin{cases} H = \\ \kappa = \end{cases}$								

Table IV.

San Diego.   *St. Thomas.*

Commence 0 h., January 1, 1869.   Commence October 4, 1872.

Year	1869.	1870.	1871.	Mean.	1872–3.	1873–4.	1874–5.	Mean.
Q $\{ \begin{matrix} H = \\ \kappa = \end{matrix}$								
L $\{ \begin{matrix} H = \\ \kappa = \end{matrix}$	0·065 62	0·028 29	0·032 117	0·042 69				
N $\{ \begin{matrix} H = \\ \kappa = \end{matrix}$	0·423 262	0·412 263	0·401 264	0·412 263				
λ $\{ \begin{matrix} H = \\ \kappa = \end{matrix}$								
ν $\{ \begin{matrix} H = \\ \kappa = \end{matrix}$								
μ $\{ \begin{matrix} H = \\ \kappa = \end{matrix}$	0·024 256	0·037 244	0·017 258	0·026 253				
R $\{ \begin{matrix} H = \\ \kappa = \end{matrix}$								
T $\{ \begin{matrix} H = \\ \kappa = \end{matrix}$								
MS $\{ \begin{matrix} H = \\ \kappa = \end{matrix}$								
2SM $\{ \begin{matrix} H = \\ \kappa = \end{matrix}$								
Mm $\{ \begin{matrix} H = \\ \kappa = \end{matrix}$								
Mf $\{ \begin{matrix} H = \\ \kappa = \end{matrix}$								
MSf $\{ \begin{matrix} H = \\ \kappa = \end{matrix}$							Meteorological	
Sa $\{ \begin{matrix} H = \\ \kappa = \end{matrix}$	....	....	....	....	....	0·007 355	0·037 222	
Ssa $\{ \begin{matrix} H = \\ \kappa = \end{matrix}$	....	....	....	....	....	0·049 98	0·061 207	

Table IV.

Sandy Hook.

Year	1876.	1877.	1878.	1879.	1880.	1881.	Mean.
$S_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·026 225	0·028 222	0·028 254	0·025 216	0·036 255	0·049 237	0·032 235
$S_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·439 246	0·432 245	0·436 248	0·445 245	0·416 242	0·435 249	0·434 246
$S_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·036 65	0·047 64	0·033 83	0·033 81	0·037 68	0·041 52	0·038 69
$S_6 \begin{cases} H = \\ \kappa = \end{cases}$							
$S_8 \begin{cases} H = \\ \kappa = \end{cases}$							
$M_1 \begin{cases} H = \\ \kappa = \end{cases}$							
$M_2 \begin{cases} H = \\ \kappa = \end{cases}$	2·238 217	2·230 218	2·272 218	2·244 218	2·229 215	2·250 216	2·246 217
$M_3 \begin{cases} H = \\ \kappa = \end{cases}$	0·025 191	0·022 196	0·021 202	0·035 192	0·029 222	0·030 206	0·027 202
$M_4 \begin{cases} H = \\ \kappa = \end{cases}$	0·020 349	0·016 339	0·017 336	0·020 321	0·024 335	0·027 329	0·021 335
$M_6 \begin{cases} H = \\ \kappa = \end{cases}$	0·049 352	0·048 355	0·053 351	0·046 344	0·057 344	0·059 342	0·052 348
$M_8 \begin{cases} H = \\ \kappa = \end{cases}$							
$O \begin{cases} H = \\ \kappa = \end{cases}$	0·178 94	0·167 95	0·133 99	0·157 101	0·177 90	0·176 100	0·170 97
$K_1 \begin{cases} H = \\ \kappa = \end{cases}$	0·322 91	0·330 91	0·340 90	0·337 91	0·333 88	0·342 90	0·334 90
$K_2 \begin{cases} H = \\ \kappa = \end{cases}$	0·129 45	0·126 34	0·113 30	0·114 40	0·130 35	0·160 40	0·129 37
$P \begin{cases} H = \\ \kappa = \end{cases}$	0·103 97	0·123 102	0·091 103	0·100 107	0·102 106	0·100 108	0·103 104
$J \begin{cases} H = \\ \kappa = \end{cases}$	0·013 86	0·024 125	0·014 145	0·014 111	0·009 107	0·025 134	0·016 118

Table IV.

Sandy Hook.

Year	1876.	1877.	1878.	1879.	1880.	1881.	Mean.
Q { H = { κ =	0·039 118	0·039 131	0·029 107	0·033 133	0·033 98	0·037 134	0·035 120
L { H = { κ =	0·103 52	0·110 47	0·108 30	0·084 35	0·075 0	0·072 21	0·092 31
N { H = { κ =	0·470 198	0·507 196	0·532 199	0·500 202	0·457 199	0·475 199	0·490 199
λ { H = { κ =	0·012 15	0·039 26	0·030 26	0·029 69	0·042 60	0·062 13	0·036 35
ν { H = { κ =	0·045 178	0·124 238	0·167 198	0·153 170	0·065 149	0·077 253	0·105 198
μ { H = { κ =	0·072 221	0·063 216	0·094 235	0·061 207	0·083 249	0·039 236	0·069 227
R { H = { κ =	0·020 324	0·030 241	0·010 19	0·011 16	0·073 318	0·037 9	0·030 334
T { H = { κ =	0·098 116	0·105 34	0·046 306	0·075 155	0·111 94	0·058 23	
MS { H = { κ =	0·045 116	0·037 122	0·050 107	0·039 116	0·041 104	0·040 114	0·042 113
2SM { H = { κ =	0·018 138	0·014 158	0·007 66	0·021 237	0·010 338	0·005 323	
Mm { H = { κ =							
Mf { H = { κ =							
MSf { H = { κ =	0·030 41	0·014 171	0·010 332	0·042 224	0·011 230	0·014 23	
Sa { H = { κ =	0·083 224	0·066 225	0·066 164	0·072 203	0·060 236	0·058 198	0·068 208
Ssa { H = { κ =							